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PhD Thesis

The C+A Theory of Time:
Explaining the Difference between
the Experience of time
and the Understanding of Time

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Summary of Thesis

The central problem addressed by this thesis is to attempt and reconcile our experience of time with our scientific understanding of time. Science tells us that time is static yet we experience it as dynamic. In the literature there tend to be two positions. Those who follow the science and claim that time is static and that our experience is mind-independent; those who favour our experience and question the science. I attempt to reconcile these positions.

To do this I adopt terminology set out by McTaggart (1908) who termed the static view the B series and the dynamic view the A series. The literature that has developed out of this breaks down into the A Theory where time is the past, present and future; and the B Theory, where time is just involves events being earlier than or later than other events. I reject both positions as accounts of ontology. I adopt McTaggart's C series, a series of betweenness only, on the grounds that it is this series that is mostly aligned to science.

Given the C series, our experience requires explanation. A claim of mind-dependency is insufficient. I argue that the A series really refers to mind-dependent features that are brought out by our interaction with the C series; much like the way that colour is brought out by our interaction with a colourless world. The B series is the best description of the contents of time, not time itself.

To examine the experience of time I adopt phenomenology to describe that experience. From within experience I show that certain features of that experience cannot be attributed to a mind-independent reality and use this as further evidence for the above claims.

Finally I suggest that most theories of time are driven by the view that a theory of time has to be consistent. I examine recent developments in logic to see whether such a consistent requirement is needed. I conclude that the most we can get out of paraconsistent approaches is inconsistent experiences, not inconsistent reality.

I conclude that the A series is the best description of our experience of time, the C series the best description of the ontology of time, and the B series as the best description of the contents of time. This reconciles our experience with our understanding of time.

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my thesis, when deposited in the University Library, being made available in all forms of media, now or hereafter known.

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Chapter 1
Introduction

This is a thesis about time and *our experience* of time. I intend to explain why our experience of time is so different to our understanding of time. This entails that our experience of time is not veridical. But first we need to bring out three senses of understanding;

1. An understanding implicit in our concepts, language and tenses. This type of understanding is a guiding function of the mind/brain, similar in some ways to Kant's synthetic a priori concepts. But these concepts may have originally been gained through evolutionary experience or evolutionary cognitive development so they are not necessarily synthetic a priori in nature.
2. An understanding in the 'common sense' about time. This is the sort of understanding to be studied by sociologists, social psychologists and other society focused disciplines.
3. An understanding developed from our best available scientific theories, guided by but not restricted to a consensus in the scientific community.

It is sense 3 that I aim to adopt. Our understanding of time ought to be informed and guided by our best available scientific theories. Specifically I will follow the Special Theory of Relativity (SR). Sense 1 may be attractive to theorists more guided by our experience. My aim here is to explain why our experience of time conflicts with the findings of scientific understanding, i.e. SR.

I will argue that our experience of time has been structured by the mind/brain. Because our mind/brain structures our experiences of time, it is natural to think that time itself is independent of that structure. This is not to say that time is totally unlike our experience. It is quite possible that time is as we experience it, but that our mind/brain still structures our experience of time. I will argue that time itself is different to our experience. This means we need two explanations: an explanation for time itself, and an explanation for our experience of time.

There are two general strategies adopted within the philosophy of time. The first is to claim our experience is veridical. Time *is* as we experience it. We experience time as having a past, present and future, because time has these properties. There is a privileged moment in time, call it the Present Moment, that moves from the past into the future. We can, following McTaggart's legacy, call this an A Theory.

The second strategy is to reject our experience of time. If our science is correct then there is no privileged moment in time that we *can* use to distinguish between the past and future. Events just occur before or after other events. We can, again following McTaggart's legacy, call this a B Theory.

Since I will defend the claim that our experience is not veridical, I may at first seem to be a B-theorist. Whilst of these two strategies I am closely allied to the B Theory, I believe, in fact, that the B Theory is false. The A series has a direction, from the past to the future. The B series has a direction, from earlier to later. However, if we take science as our guide, as I intend to do, then there is no direction involved with time. The B Theory tends to assume that this direction exists. The B-theorist takes time to involve the relations of earlier/later than and so on. But science is time symmetric. The B Theory is not a true description of time.

McTaggart also talks of a C series, which involves events just forming a series, whereby one event is between two other events. The C series has no direction, it just is a serial ordering of events. I believe this to be the true description

of time. If so, then our experience of time is significantly different to the ontology of time described by the C series.

1. *Newton and Time*

To understand what we could mean by time I will turn to a famous description from Newton.

> Absolute, true, and mathematical time, in and of itself and of its own nature, without reference to anything external, flows uniformly and by another name is called duration. Relative, apparent, and common time is any sensible and external measure (precise or imprecise) of duration by means of motion; such a measure – for example, an hour, a day, a month, a year – is commonly used instead of true time.
>
> (Newton, 1726, p. 408)

Newton here is comparing absolute time with relative time. My purpose here is to use this quote to derive concepts we might associate with time, not to undertake a scholarly analysis of Newton's claims.

There are a number of concepts we can unpack out of this claim.

1. time is absolute.
2. time is true
3. Time is mathematical
4. Time has an intrinsic dynamic nature

Time as absolute (1) means that time exists and is not relative to the observer. It is not clear what (2) means. 'True', when applied to a thing could be taken in three ways; 1, to mean authentic, as in a true pearl; 2, to mean genuine, or loyal, as in a true friend; and 3, to mean accurate, reliable, as in a true compass. So time is true of what? It is true that time exists? Possibly. Is it that the time of our experience is true? Possibly. Time as true might be tied into (1), but if so it merely counts as a restatement of it. Time is true in the way that this desk is true: i.e. it is true that time exists. We could also say that time is accurate, just as someone's aim is true, when they hit a target. Here, time is accurate, and this seems to lead into the concept of time as mathematical. Time as mathematical (3) implies some sort of counting or measuring. We can separate time into countable units: seconds; hours; days and so on. The mathematical concept here might mean a way of employing numbers to describe absolute time.

This time has its own nature, a dynamic one (4). This is the claim of an A-theorist. Time flows at one speed. This flow is an intrinsic property. If so, then we might hold out the hope that the concept expounded in Newton ought not commit us to a second time series against which to measure that flow. This time is absolute and independent of our experience of time.

'Relative and apparent' time is some common external and imprecise way of measuring time. This time is used to gauge the passing of time, independent of the passing of absolute time itself. It is *this* time we break up into hours, seconds and so on. We then refer to this time instead of true, mathematical, flowing absolute time. Newton's description here foreshadows problems I will raise with theories of time that draw conclusions *about* time from our experience *of* time.

Not mentioned in Newton's quote, but in need of discussion, is the role of time in our experience of time. Time itself, whatever that may be, is measured. To ensure this measurement is correct we might think time plays a role in determine the truth of our measurements and statements about time.

This preliminary look at Newton's conception has helped give us some basic pointers towards understanding some of the issues surrounding time: (a) its

ontological status; (b) its role as a truth-maker; (c) its nature, dynamic or static; (d) is it discrete, made up of several chunks, or a single continuum?; (e) our experience of time. Much of this work was my own and not intended as an analysis or critique of Newton. Rather, I introduced Newton merely to motivate a discussion of concepts we commonly associate with time.

This thesis is about time, but more specifically about the ontological status of time and our experience of time. As such I will focus on questions about (a), (c) and (e). These three questions will be the focus of my thesis. I aim to show that time is real and static. A significant amount of work will be done to explain (e), our experience of time.

2.   *A- B- and C- Theories*

I want to set out here what I mean by A-, B-, and C-theories. The terminology here follows McTaggart, and I will assume that any theorist who claims to be a particular type of theorist is correct about that claim; e.g. Mellor claims to be a B-theorist and I accept this claim at face value, i.e. that Mellor *is* a B-theorist. However there are other ways of talking about time, and to avoid confusion I will group these theories into McTaggart-esque terminology. These will be just general descriptions, but should give a guide as to how I treat theories about time.

I will treat all theories that invoke, explicitly, the following when talking about time as A-theories: the present moment, or now; the past, present and/or future; presentness as a property; tenses. An example here would be Storrs McCall who uses branching time to distinguish between the past (closed single branch) and future (open numerous branches). Parsons (2002) identifies several different theories that get clustered together as A-theories and treated as *the* A Theory. Parsons seems to think that if McTaggart did not identify it, it is no part of the A Theory. As such, taking tense seriously is no part of the A Theory; statements about B-relations as reducible to A-properties is no part of the A Theory since McTaggart rejected temporal properties, and so on. I, however, shall treat all theories that are explicitly dynamic in nature as being an A Theory. It does not follow that there is only the one A Theory, Parsons is correct there.

By B Theory I mean any theory that denies the above but invokes causal relationships, or any other relationship with an implicit temporal nature; for example B-theorists talk in terms of events being earlier than, or later than other events. 'Earlier/later' being implicit temporal terms. Such theories would include detensers, such as Bertrand Russell (1915). Parsons (2002) thinks that all theories that deny the A Theory are B Theories[1]. I will however argue that there is another temporal theory that denies the A Theory but is not the B Theory: the C Theory.

By C Theory I mean any theory that denies that time is dynamic in any way, or even involves events being earlier than or later than other events and so on. D. C. Williams (1951) talks of time as being purely static. I will count myself as a C-theorist and show that this classification is correct. It is my intention to show that the C Theory is the correct theory of time itself.

My theory is more than a plain account of time however, so more needs to be said. The terminology here is based upon the series adopted to explain time. A-theorists adopt the A series, B-theorists the B series and C-theorists the C series. However, the theory I adopt is more complicated than that because it is invoked to explain time, as reflected in our understanding of time, and our *experience* of time. As such the theory needs to provide more than an account of the ontology of time, based on the C series; it is also to provide an account of the experience of time. As

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[1] Parsons, 2002, p. 2.

such my theory could be classified a $C_{Ontology}+A_{Epistemology}$ Theory. Time itself is reflected by the C series, and our experience by the A series. I think this correct, but a little wordy, so will refer to my theory as a C+A Theory of time for short.

3. *Structure of Thesis*

In Chapter 2 I set out McTaggart's theory of time. An understanding of the conceptual framework established by McTaggart will lay the grounds for later work. McTaggart distinguished between the A, B and C series. He hoped to show through these that time is unreal. We may reject this claim since this conclusion conflicts with current science, which supposes that time has a physical presence. In Chapter 3 I look at some of the reactions to and interpretations of different aspects of McTaggart's argument. This should clarify the argument.

In Chapter 4 I turn to look at the A Theory. A-theorists reject McTaggart's conclusions and argue that the A series is the true description of time. A-theorists claim that our understanding of time reflects our experience of time: time *is* as it is experienced. I will look at some attempts to develop a theory around the A series and show that these theories fail. The A Theory requires an ontology that conflicts with science, and the problems McTaggart had with the A series have not been satisfactorily dealt with. I will conclude that the A Theory cannot give us an account of time itself. At best it can only give us an account of our experience of time.

In Chapters 5 and 6 I look at B-theorist responses to McTaggart's conclusion. B-theorists think time involves the relations of events being before or after other events, or of events being simultaneous with other events. I will raise some of the attractions of adopting the B Theory, and show that there are significant problems for this view. The B series is not as analytically basic as many B-theorists assume it to be. In Chapter 5 I will argue that there is no external determinant of the direction of time to give the B-theorist his distinctions between earlier/simultaneous and later. If so, then the B Theory could be seen as being under supported by science. In Chapter 6 I turn to look at the semantic and experiential problems associated with the B Theory. I will argue that the B Theory can overcome these problems, but nevertheless is less preferable than the C+A Theory, since the C+A Theory does not make the assumptions seen to be problematic in Chapter 5.

In Chapter 7 I suggest that problems with the A and B Theories entail a third approach. This chapter is largely a historical survey, where I look at approaches that serve as a background to a general push towards developing a complete theory of time that explains time *and* our experience of time. Here I also lay out the grounds for my preferred third approach based on the C series: The C+A Theory.

To develop the C+A Theory we need to develop (1) an ontological account of time itself and (2) an account of the role of the mind/brain in our experience of time. I turn to the first task in Chapter 8. If any ontological account of time is to be taken as a basic description, then the theory we adopt must not require further analysis. I believe that the ontology of time is best developed out of the C series: I will call this time Ontic Time. The second task I develop in Chapter 9.

The second requirement for the third theory of time was an account of the role of the mind/brain. I here develop an account of the time included in our experience, which I call Epistemic Time. A theory of Epistemic Time must meet two objectives: it must be A-ish enough to explain our experience of time but not too A-ish, otherwise McTaggart's Paradox reappears. I develop an analogy with the perception of colour to give an insight into what I mean by Epistemic Time being

mind-dependent[2]. I develop this analogy specifically with the secondary quality views of perception in mind. Since I place a key role for our experience on the mind/brain, this chapter lays the ground for those to follow. This concludes Part One of my thesis.

In Part Two I develop a phenomenological analysis of our experience of time. To do this I start by settling on a method for analysing our experience of time. In Chapter 10 I adopt phenomenology as that method. Phenomenology is a purely descriptive method that focuses on our experiences. I intend to develop some phenomenological data to analyse our experience of time. This will describe the features of time that we will sort into features of Epistemic Time, of Ontic Time or of both.

What I have been calling Epistemic Time, and what others tend to refer to as mind-dependence, those writing in the European tradition, e.g. Husserl, Heidegger, tend to speak of as 'Temporality'. Temporality is the normal appearance of time within our phenomenological experience. Within the phenomenological tradition we are not to draw any conclusions about this apparent character of time, merely note that this is how we experience time. The analysis of time itself develops out of the phenomenological conclusions from that experience.

In Chapter 11 I start my phenomenological analysis of our experience of time, beginning with duration and succession. I continue the analogy with secondary qualities to see whether certain aspects of our experience of duration and succession *could* be taken as experiences of mind-dependent temporal qualities.

In Chapter 12 I turn to the Present Moment and it is here where most of the work needs to be done. It is the Present Moment that is in dispute. With the B-Theorist I conclude that there is no privileged moment in time. There is no ontological version of this moment, yet we experience time as having one. The phenomenology of the Present Moment is the key to explaining why our experience of time is so different from time itself. Here I will argue that Husserl's phenomenology of the Present Moment is the correct position to adopt. This phenomenology will capture the complexities of our experience and show why we cannot map that experience onto time itself.

In Chapter 13 I combine the phenomenological concepts developed above to look at the phenomenology involved in the flow of time, adding in the experience of temporal direction. I will argue that our experience of this flow involves some apparent necessity, which we ought to question.

Chapter 14 gives an account of how we could move beyond the phenomenology to claim that our subjective experience *can* be used as a guide to an ontological reality. To do this I will look at the concept of intersubjectivity. I also survey two ways of characterising our experience of time: on a projectivist account, whereby the subjective experience is projected onto the world; and on a perspectivalist account, where our perception of time reflects our perspective *as Beings in time*. Either account can give us a satisfactory account of why we mistake the mind-dependent aspects of our temporal experiences as veridical experiences of time itself. This will conclude Part Two of my thesis.

In Part Three I tie the threads of Parts One and Two together to fully develop the C+A Theory of Time. I start in Chapter 15, by arguing that the ontology of time is described by the C series, and that the A series gives us the epistemology of time.

In Chapter 16 I draw support from other followers of Husserl; notably Heidegger, Sartre and Merleau-Ponty. In Chapter 17 I develop a model of how

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[2] When I say mind-dependent I really mean mind/brain-dependent since I do not wish to decide between a dualist or a physicalist position. As such, whenever I say mind-dependent I really mean mind/brain-dependent, but choose the former solely on aesthetic grounds.

Epistemic Time could operate. I do this merely to point towards a possible model that explains why our experience of time is an experience best described by the A Theory.

Most of my thesis follows the literature in assuming a requirement that we develop a consistent theory. In Chapter 18 I turn to acknowledge recent developments in logic that suggest an inconsistent theory need not be rejected on a priori grounds alone. A failure in consistency need not *necessarily* lead to the rejection of a theory. I examine these approaches to see how they may impact on a philosophy of time: they may undermine many of these approaches including my own. I will argue that contradictions lie, like our A-ish experiences, within the realm of our experience of time. The contradictions here are more than inconsistent thoughts about our experiences: we *experience* time in an inconsistent way. But these contradictions do not, I will argue, infect our ontology.

If inconsistency is restricted to our linguistic and non-linguistic experience, a requirement that applies to this thesis as a whole is that the ontology of time is assumed to be consistent, so any theory about that ontology be consistent, not paraconsistent[3].

4. *Spatialising Time*

B-theorists are sometimes accused of assuming space and time to be identical, where temporal indexicals such as 'now', 'past' and 'future' are counterparts to spatial indexicals such as 'here' and 'there'. The C+A Theory is even more open to such a criticism: it has no anisotropic nature available to explain the difference between time and space. Time is not like space, yet the C+A Theory suggests it is. If time is a dimension where objects and events are separated by a relationship of between-ness, with no dynamic nature then it seems to be just like space. I reject such a claim, since there are other differences relevant: notably causation.

Even those who took time and space to be importantly similar accept that time is different to space. Kant, for example, held that time and space were ideal concepts, with no ontological reality. Time here would seem to be identical to space: neither exists. Even so, Kant believed time to be different to space. He held time to be the form of *inner sense*, and space the form of *outer sense*. Mellor (1998) holds that time is the dimension of change: change is not like spatial variation; change in time involves causation, and since a cause is not simultaneous to its effect we have a prima facie difference where time and space are concerned.

I do not intend to offer a fully worked out account of how time is different to space. Rather I will make the common sense assumption that time and space, though similar are not identical, I will also assume that neither an A, a B nor a C+A Theory needs to claim that they are identical.

5. *Conceptual Analysis*

We make a commonsense distinction between objects, such as chairs and cups of coffee, and events, such as football matches and concerts. We tend to think of objects as existing entirely at each time they do exist. Events however extend over time (and have temporal parts). A football match starts at a certain time, say 3pm, and lasts for a set amount of time, 90 minutes. Some are uncomfortable with things having temporal parts and take this to be the difference between things/objects

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[3] The language here is quite technical. 'Paraconsistent' is used to describe theories and logics that tolerate contradictions. 'Inconsistent' is used to describe states-of-affairs, whether they be beliefs, experiences or reality that are in some way contradictory. Consistency applies to all cases where contradictions are ruled out.

and events. Mellor (1998), for example, distinguishes between objects, such as chairs, and events, such as symphonies, precisely because objects do not have temporal parts, whilst events do. As such, Mellor believes objects change but events do not.

Philosophers have introduced terminology to distinguish between these two positions. Objects, such as chairs, which exist wholly at each time are said to endure through time; events, like symphonies, are extended across time and have temporal parts. We ordinarily think that the whole of the chair is present at every moment of its existence. Such talk is called the 'enduring' view. When we say of the symphony at time T that 'it is loud', it is only to that part of the symphony, at time T, to which we are referring. There may be quiet parts of it. Such talk is called the 'perduring' view. Symphonies and similar events, like sports matches, have temporal parts. Objects such as chairs do not.

But this view has been challenged, and rightly so. According to the perdurantists, objects such as chairs *do* have temporal parts, and are spread out across time in much the same way as temporal events, such as symphonies. My talk of all objects in time as events, naturally leads to a perdurance view of existence. So at T when I say that 'this chair is red', I am only referring to the part of the chair that is present at T: that temporal part of the chair. This is a controversial view, and I lay it aside, for my conclusions can be easily incorporated into an endurance or perdurance view of events and objects[4]. Nothing in my thesis hangs on the distinction so we only need to be aware of it.

6.   *Themes*

This thesis is in three parts and has two general approaches. Part One is mostly analytical, and works within the tradition established by McTaggart. Part Two is largely phenomenological and works within the tradition established by Husserl. Part Three, whilst mostly analytical tries to meld the two approaches to draw out my general conclusion: that time is Ontic Time (based on McTaggart's C series) and our experience of time is Epistemic Time (based on McTaggart's A series).

To unpack these issues further I now turn to develop the conceptual framework proposed by McTaggart. McTaggart agreed with Kant that time was unreal, but came to this conclusion for different reasons. He is mistaken, but to see this we first need a clear understanding of McTaggart's theory, an understanding based on the whole of McTaggart's theory, not merely those parts that have been anthologised in the philosophy of time. One of his arguments against the A series has been ignored, and this is a mistake, for this argument undermines the A Theory in any and all of its current forms. Also, by ignoring McTaggart's C series, a significant amount of his thought has been ignored.

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[4] For more on this debate see Lewis (2002), Mellor (1998), Schlesinger (1980) , Sider (2001), Van Inwagen (1990 & 2000).

1. *Introduction*

I will follow a long tradition in developing a theory within a conceptual scheme established by McTaggart. To do this, I intend here to set out McTaggart's theory, upon which I will develop a C+A Theory. Most of the work here is exposition and, unless otherwise indicated, the thoughts are those of McTaggart himself[5]. McTaggart argued that time is unreal. This conclusion conflicts with current science, which supposes that time has a physical presence. To adopt McTaggart's framework we will need to reject this conclusion[6]. We first need to understand McTaggart's theory and this chapter is dedicated to setting this out in some detail. I turn in Chapter 3 to look at reactions to McTaggart; here I am concerned solely with McTaggart.

2. *McTaggart's Conceptual Scheme*

McTaggart (1908) sets out a minimal requirement if time is to be objectively real. If time were real, change must be possible. McTaggart identified two ways of talking about time. We talk of events as being either in the future, present or in the past[7]. He called this the A Series. We also talk of events as being before, during or after other events. He called this the B Series. Both distinctions are essential for time: events are observed as being present, and as being earlier and later than other events. Those events that are earlier than present events are past; those that are later are future. In both cases there is a serial ordering, independent of 'time', and he called this the C series.

McTaggart is going to set out three types of series and show that only one of these series is real. McTaggart thinks that the A and B series apply to the C series. What this application means we will turn to shortly, for now it is sufficient to note that if, as McTaggart claims, only the C series is real, then the A and B series seem to be interpretations, or conceptual manipulations of that series. This suggests that the A and B series are *concepts* only, but as we will see, McTaggart is unclear here. In his favour, McTaggart thinks that we misrepresent the C series as a temporal series, and this certainly suggests that concepts are involved.

McTaggart thinks the A series more basic than the B series. We might think the B series is more fundamental than the A series, for it is permanent and objective. If M is earlier than N it will always be true that M is earlier than N. McTaggart rejects the thesis that the B series is more fundamental because he believes that time

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[5] McTaggart's analysis appeared in two forms: in a 1908 article 'The Unreality of Time', and as part of his book, *The Nature of Existence*, (1927). I will mostly focus on the argument in his article; it is a more succinct presentation of his argument. His later work will be important when dealing with the C series, an aspect of his analysis that has not been addressed in the literature.

[6] I believe that whatever is indispensable to our science should be taken to be real. Minkowski (1908) provided a geometrical structure to the equations of the special theory of relativity (SR). By doing this, Minkowski tied space and time together. '[Space] by itself, and time by itself, are doomed to fade away into our shadows, and only a kind of union of the two will preserve an independent reality' (Minkowski, 1908, p. 75). Since time is an identifiable aspect of the primary reality of space-time, we have independent reasons to reject McTaggart's conclusions. Since time is indispensable to our science, we ought to take time to be real. It remains to be shown which form time takes. I will develop this claim in later chapters.

[7] McTaggart called any content of a position in time an event. This means that a chair existing at time T is an event.

requires change[8]. But the B series does not give us change. To get change we need the A series. If M is present, it was future and will be past. First we need to look at McTaggart's claims that the B series does not give us change. This will bring out what McTaggart means by change. He uses a technical concept aligned with his take on 'series'.

3.   *Change and the B series*

McTaggart argues that if time is to be taken as a mind-independent feature of an objective universe then time must involve change[9]. When we say that some thing stays the same, we mean that it remains the same while other things change. McTaggart now argues that the B series cannot give an account of change.

McTaggart argues that time cannot be B-time. Take an account of an event in the B series. Event N, is earlier than event O, later than M, and simultaneous with N^1. But such an account cannot give us change. An event 'can never get out of any time series in which it once is' (McTaggart, 1908, p. 459). Event N, if earlier than O and later than M will *always* be earlier than O and later than M. There is no change involved in such an account. Without change, McTaggart denies that this series could be a time-series.

As a concept, we might think change applies more easily to objects than to events. It is quite obvious what we mean when we say that a poker has changed from being cold at time T to being hot at time T^{+1}. Here there is a change *in* the poker. It is not quite so obvious what we mean when we say that there is change in an event. When an event, such as WWII, 'changes' we could mean that it changes from a war on one front to a war on two fronts. We could mean that it changes because it started when Hitler's Germany invaded Czechoslovakia, not Poland. We could mean that it changes position *in* the B series. We seem to distinguish three ways in which an event could change.

1. A change in the progress of the event; whereby events alter, such as WWII changing from a war along one front to one along two fronts.
2. Counterfactual change; whereby events may have been different in some way, such as WWII starting when Germany invaded Czechoslovakia, not Poland.
3. Change in order within the series; whereby a change in WWII would involve it happening after the Korean War and before the Vietnam War, instead of it having happened after WWI and before the Korean War.

Type 1 change is more closely aligned with the B Theory. McTaggart is more aligned with type 3 change. Type 3 change is change in the relative position of events in a time series. However, type 3 change is not McTaggart's concept. McTaggart's concept of change is change in position in a time series that constantly occurs. What McTaggart wants is the following:

4. Continuing change in position in a series; whereby a change in WWII would involve it moving from the future, to the present; or from the present to the past and so on.

Type 3 change just is a rearrangement of events in the B series. What McTaggart wants is this change to continue, i.e., type 4 change. I have couched type 4 change in A-language. This, as we will see, is because McTaggart believes that the B series cannot account for change.

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[8] McTaggart briefly surveys the possibility that the A series is mind-dependent and the B series mind-independent. He rejects this move on the basis of time *requiring* change, and the B series being unable to give us change.

[9] Geach, 1979, says that few people would deny McTaggart this claim.

McTaggart thinks that the B series alone is not sufficient to give us change in an event. At first it seems like McTaggart is confusing type 1 change for type 3 change; confusing the change in an event simpliciter, and the change of an event's position time. When a poker is cold at time T and hot at time T^{+1} a change has occurred: this is a change *in* the object, not of that object's position in time. That this poker is in time and earlier and later than other events is something different entirely. McTaggart responds by arguing that since the poker being cold is earlier than the poker being hot: the poker being cold is a different event to the poker being hot. McTaggart also ties the poker to absolute time: The poker is cold at time T and hot at time T^{+1}, since time T is earlier than time T^{+1} there is no change, for the poker's being cold is always earlier than the poker's being hot. 'Each such moment would have its own place in the B series…[And] as the B series indicate permanent relations, no moment could ever cease to be, nor could it become another moment' (McTaggart, 1908, p. 460). There is no real change involved here.

However, those who reject McTaggart's conclusions about time but accept his rejection of the A series tend to think that the B series does give us change. Take McTaggart's rejection of the poker being cold at T and hot at T^{+1} being sufficient to give an account of change. B-theorists argue instead that even though things being different at different times is a weakened type of change to A-change, it still counts as change. To examine this claim I will set out Mellor's theory of change.

Mellor (1998) bases his theory of change on the distinction between objects and events; Mellor believes that objects endure, whilst events perdure. Since events have temporal parts, and each part remains the same, events do not change. The start of a football match will always be earlier than the middle, and later than the warm up. As such perdurance involves type 4 change, or rather takes type 4 change to be the criteria of change. According to Mellor, perdurance fails type 4 change; i.e. events do not change because their temporal parts always remain in the same position of the B series. Objects by contrast endure, so any change in *an object* is not like change in *an event*. 'This means that things, unlike events, *are* wholly present at each moment within their *B*-times' (Mellor, 1998, p. 86, original emphasis). A poker being cold at time T is *incompatible* with that poker being hot at time T^{+1} because it is *the same poker*, not a temporal part of that poker. According to Mellor this counts as change because change involves things having incompatible (real) properties. Enduring objects that are cold at T and hot at T^{+1} have changed.

McTaggart could respond here that such an account only gives us variation, *not change*. As we saw above, McTaggart argued that the poker being cold at T is a different event to the poker being hot at T^{+1}. On this account Mellor seems committed to the poker not changing; the poker cold at T is always earlier than the poker being hot at T^{+1}. However, even if we could reinterpret Mellor's endurance account into McTaggart's perdurance account there is no reason why this variation, weak as it is, ought not count as change. Take walking along a field. Half way along the field it changes from being flat to being on an incline. This change occurs in the middle of the field and will *always* occur in the middle of the field. Yet it still seems to be a change in the field. Analogously, even though the poker at T is cold and this is earlier than (and always *will be earlier than*) the poker hot at T^{+1} this variation still gives us an account of change.

McTaggart however, thinks these accounts too weak to give us change. This is because change is something that happens to objects and events; and the change discussed here, in Mellor's form or my own, really only is type 1 change in events and not real change since there is no change in position in the B series. McTaggart wants change in position in a series, and the B series cannot deliver this type of change. McTaggart wants type 4 change.

McTaggart argues that neither can we think a change in the characteristics of events gives us change[10]. Take the death of Queen Anne. What change can occur to the death of Queen Anne? The causes may change, that the 'Anne' is Anne Stuart may change. But if so, then the event would not be the death of Queen Anne, it would be some other event. The change here is of the event, not of the event's position in time. That the death of Queen Anne occurred after the life of Queen Anne does not involve any change in time.

The change here is counterfactual change, i.e. type 2 change. The example here is unfortunate given Kripke's claims about the necessity of origin. In McTaggart's example the change could have been a change of Anne Stuart into Anne Tudor. This view conflicts with Kripke's (1980) necessity of origin. Kripke asks how a person, in this case, Anne Stuart (McTaggart's not Kripke's example) originating from different parents and a different sperm and egg, be *this woman* (i.e. Anne Stuart)? This falls in line with Kripke's belief that identity is necessary. So the death of Queen Anne necessarily involves Anne Stuart. We could remove any conflict here, without assuming Kripke right, using a different counterfactual claim. It could have been the case that the temperature on the day of Queen Anne's execution was one degree colder than it was in the actual event. This is change in the characteristics of the event, which is compatible with Kripke. McTaggart would deny that this change altered the event in any way, since it would still be the death of Queen Anne, and occur at the same B-time.

Thus, McTaggart believes, time described by the B series does not involve change. It follows that the B series alone cannot account for time. This has been challenged, rightly I believe, but the rejection of B-change is an essential step in McTaggart's argument so for the sake of argument will let it pass. There is, of course, one characteristic of an event that can change without affecting the nature of that event, and this is it's position in the A series. That event started out as being a future event, changed to become a present event and changed further still by moving into the past, and then further into the past. I set this out above as type 4 change.

4. *The fundamental Nature of the A Series for Time*

According to McTaggart, only the A series gives us change. When an event moves from being future to being present, one characteristic of that event does change. The characteristic of an event that does change is its position in the A series. The death of Queen Anne would still be the death of Queen Anne, but the event *has* changed, from being future to being present to being past. The change McTaggart is interested in is type 4 change, where the nature of events do not change, they only alter their position in the series. Any other change would be a change of that event (either type 1 or type 2 change, and McTaggart wants to avoid these).

McTaggart believes change is central to time and this makes the A Series the fundamental structure of time. The B series whilst a temporal series could only be real if time were real. The B series is temporal since M is earlier than N, and this means that N occurred at one time and M occurred at another (earlier) time. The B series also has a direction in time, from earlier to later. Only if the A series were real could there be time, so the (necessarily temporal) B series must rely on the A series[11]. McTaggart also claims that the A series is more fundamental because we cannot define it using any other terms; we can only demonstrate it through

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[10] McTaggart uses "characteristic" to refer to qualities, properties and relations relevant to that event.
[11] Bigelow (1991) argues that the B series requires the passage of time *to be a temporal* series. It is only when the passage of time is applied to the earlier/later distinction that this relation takes on its familiar temporal form. Otherwise there is no difference in the earlier/later ordering to the up/down ordering.

examples[12]. Whereas the B series can be defined by the A series: given the A series concepts past, present and future we can define events in the past as earlier than present events and present events as later than past events and so on. Formally we could set this out as follows: E_1 is earlier than E_2 iff $\exists T(E_1$ is past at T and E_2 is present at T). This makes the A series more fundamental.

McTaggart's basic claim is that the A series is more fundamental than the B series because:

        a.   To understand concepts in the B series we need the concepts of the A series, but not vice versa.

        b.   The B series would not exist as a time series without the A series.

There are two senses of the A series being more 'fundamental' than the B series at play here. (a) takes the A series to be *conceptually* more fundamental than the B series. (b) takes the ontological existence of the B series to *rely* on the A series. These types of fundamentality act in particular ways. McTaggart adopts a combination of the two. We will see that only a combination of the two makes sense, in McTaggart's view anyway. I will talk here of the A series being more fundamental than the B series as the A series taking priority over the B series, whether conceptually or ontologically.

We can think that a concept X is conceptually prior to concept Y iff Y requires X to be understood. We could say that the concepts of the A series *and* the concepts of the C series are required if we are to understand the B series *as a time series*. McTaggart argues that the concepts of the B series can be got out of the A series. Whereas the concepts of the A and C series cannot be got out of anything else. If there were no A series we could not get the concepts of the B series. If there were no A series, there would still be a series and this seems to show that the C series is conceptually prior to the A series and the A series required for the B series. But McTaggart thinks that the C series is as fundamental as the A series. It is the combination of the A and C series that gives us the concepts of the B series. This means that the C series is no more conceptually fundamental then the A series, but both are more fundamental than the B series. This is based on his claim that the concepts of the A and C series cannot be got out of anything else.

We could argue for the ontological priority of the C series as follows, though this makes the B series prior to the A series. We can think that a series S is ontologically prior to another series S_1 if S is ontologically more basic than S_1; i.e. has less structure. The C series has the least structure so in this sense is more fundamental. Next comes the B series with a limited earlier/later structure. Finally comes the A series with its rich past, present, future structure. Here the C series is ontologically prior to the B series, which itself is ontologically prior to the A series. The C series is the more basic, so thus has ontological priority. The order here is C series, then B series, and then A series.

Staying with the issue of ontological priority for the time being, we can note the following. This is not McTaggart's view: he believes that until the A series has ontological status, the B series *cannot exist*. The B series can only be real if it is a time series; and since time relies on the A series, the B series cannot be real until there is an A series[13]. The C series is real, since events are set out in a series. The order of ontological priority here is C series and A series, which combined gives us the B series. This does not follow the order I set out as determining the ontological priority of a series, since the A series is prior to the B series but richer than the B series. This is because McTaggart thinks that ontologically temporal priority is

[12] McTaggart, 1908, p. 463.
[13] McTaggart, 1908, p. 461.

based on type 4 change; ontological priority is determined by change (in position in a series). This explains how the A series is more fundamental than the B series, since the B series can only be real *if change is real* and only the A series gives us change. It does not explain why the C series is more fundamental than the B series since the C series does not involve type 4 change.

It could be that the A series and C series are different types of series; where the A series is a temporal series whilst the C series is a non-temporal series. Both are prior to the B series because the A series is prior to the B series and the C series is on the same level as the A series. Yet there is a nagging thought that the C series *is a series* and should take priority over a temporal series for the reasons set out above; it has less structure than the A series so is more fundamental.

We could explain the priority of the C series if we take McTaggart to be developing a conceptual and ontological theory. Here the C series' priority is determined by its real ontological status, whilst the A series takes conceptual priority because of type 4 change. The A series is conceptually prior to the B series because the concepts of the B series, to be temporal, rely on the concepts of the A series; without A-concepts, B-concepts would not be *temporal* concepts. The C series is prior to the A (and B) series, not because it gives us change, but because it is ontologically real. This comes much later in McTaggart's argument and is derived from the conclusion that the A and B series are unreal.

McTaggart's claim is that the B series relies on the A series. Both are time series, so the B series could not be real unless it were *a time series*. To become a time series there must be the A series to give us change, and thus time. Whilst this seems to be conceptual priority, McTaggart suggests it is really ontological; for time to be real the A series must be real, until then the B series could not be real. Without the A series we still have a series: the C series. This suggests that the C series is more fundamental. But McTaggart thinks the fundamental status of the A and C series is equal. They are not equal because they are different types of priority. The C series takes ontological priority whilst the A series takes conceptual priority. We will see in section 6 why McTaggart only gives the A series conceptual status.

5. *The C Series*

There is a sense where neither the A nor the B series is ontologically basic. The A and B series presuppose a serial ordering of events upon which they impose further properties. McTaggart does not couch it in these terms. Rather he believes that the real series (one that is real in all possible worlds, say) is the C series. If time is to be real we require the A series and if time were real there will also be the B series. The B series is as central to time as the A series but the A series is more fundamental. Only when we combine the A series and the C series can we generate the B series[14]. I turn here to look at the C series in greater detail.

Take four events, M, N, O, P. This order can only vary in one way; P, O, N, and M, it cannot be N, O, P, M, or any other variation[15]. The C series has an order, but it has no direction: it is isotropic[16]. The order of events *could* run M, N, O, P or P, O, N, M. McTaggart draws an analogy with the natural numbers. Natural numbers form a series but have no preferred direction, though McTaggart argued that

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[14] Note that McTaggart, while saying that this is the case, fails to give us a formal account of how exactly we add the A series to the C series to get the B series.

[15] McTaggart questions whether we can even call these 'events', for we tend to use 'event' to refer to realities that exist in time, and the C series is a non-temporal serial order.

[16] We can define isotropic as a series having the same physical components in all directions. An isotropic series in time then would have an infinite future and an infinite past with no ontological difference between the two.

one direction appears more natural to us[17]; the natural numbers have a single end point (0) and it appears more natural to us to start at that point. Departing somewhat from McTaggart here we can move to integers. Like the natural numbers integers are ordered but there is no single end point, from which we can naturally start counting. McTaggart thinks that the positive integers have a more natural reading, but we are free to go one way (positive) or the other (negative).

McTaggart argues that to temporalise the C series we need the A series. Once we have combined the A and C series we can generate the B series; for the A series gives the C series a direction, turning it from isotropic to anisotropic. '[The] A series, together with the C series, is sufficient to give us time' (McTaggart, 1908, p. 463). It is only the combination of the A and the C series that gives us time. The C series alone is insufficient. Whilst the A and the B series are 'equally essential to time' (McTaggart, 1908, p. 463), it is the A series that is more fundamental as a time series and if the A series is rejected, the B series as a time series gets rejected. Rejecting the A and B series leaves us with the C series, which alone cannot give us time. If time is real, it requires the A series. Now McTaggart seeks to show that the A series cannot be a real series, and it follows that time is unreal.

6.   *The Incoherence of the A Series*

The only series that gives us change, and thus time, is the A series. But the change of the A series involves a paradox. I will call it 'McTaggart's Paradox'. This paradox is central to the rest of my thesis so I will take some time developing it here, mostly in the way that McTaggart develops it. There may seem to be an easy escape from the paradox, but McTaggart thinks these escapes are illegitimate. He argues that we either solve the paradox through the use of circular reasoning or by the introduction of an infinite and vicious regress[18]. These solutions fail, leaving McTaggart's paradox unresolved.

To elaborate, change occurs in the A series when an event moves from being in the future, to being present and then into the past. The distinctions past, present and future are incompatible: an event, E, cannot be past *and* present *and* future. However, it turns out that every event attracts all three determinations simultaneously, and McTaggart takes this to be inconsistent with them being incompatible. Event E is past, and present and future. But this is incompatible with the view that what is past *cannot* be present or future; with the view that what is present *cannot* be past or future; and what is future *cannot* be past or present. McTaggart puts it in the following way:

> Thus all the three incompatible terms [past, present and future] are predicable of each event, which is obviously inconsistent with their being incompatible, and inconsistent with their producing change.
>
> (McTaggart, 1908, P. 468)

If all incompatible determinations are applicable to events, then those determinations cannot be real. The A series then is unreal; and it follows that time is unreal.

The change in the A series involves an event, E, being past or present, or future[19].

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[17] McTaggart, 1908, p. 462.

[18] Whilst a vicious regress and a circle are often seen as the same, there is a subtle difference. I aim to show that many attempts to resolve McTaggart's Paradox use one to escape the other. Since we could not use a vicious regress to escape a vicious regress, this difference will become apparent as I develop my thesis.

[19] The 'or' here is what logicians refer to as the exclusive or. The 'or' only allows one of the options. For example I could either go on holiday to Malaysia *or* to England, but not both.

> Past, present, and future are incompatible determinations. Every
> event must be one or the other, but no event can be more than one.
>
> (McTaggart, 1908, p. 468)

The only change the A series gives us is change in position within that time series. Above I referred to this as type 4 change, but a more appropriate name for it here would be A-change. A-change, involves events moving from the future to the present then onto the past. McTaggart argues that A-change relies on events only attracting one of these determinations at a time. If these determinations were compatible, then the A series would not give us change. Were event E past, present, *and* future then there would be no A-change. Without A-change there would be no time[20]. Type 4 change only makes sense if past, present and future are incompatible. But McTaggart goes on to show that each event 'has them all' (McTaggart, 1908, p. 468).

In summary McTaggart's Paradox involves events in the A series attracting incompatible determinations simultaneously. This is inconsistent with those determinations being incompatible, and as the quote above suggests, inconsistent with them producing type 4 change.

There appears to be an easy escape from the paradox. We could say that if event E *is* past, it *has been* present and future: if E *is* future, it *will be* present and past: if E *is* present, it *has been* future and *will be* past. No event is *simultaneously* both past and present, future and past etc. This appears to avoid the paradox, but McTaggart argues that it fails on two accounts: it is circular, and it introduces an infinite regress.

By denying that any event possesses these distinctions *simultaneously* we are assuming the existence of time to provide an account of time involving the past, present and future[21]. To say that each determination is held successively is to say that time is the dimension that allows us to apply the incompatible predicates. However this means we must have an explanation of time *independently* of the A series. But since the A series was introduced to explain time, no such independent explanation can exist.

> Time then must be pre-supposed to account for the A series. But
> we have already seen that the A series has to be assumed in order to
> account for time. Accordingly the A series has to be pre-supposed
> in order to account for the A Series.
>
> (McTaggart, 1908, p. 468)

I call this the 'vicious circle' argument[22]. When we say that an event has the characteristics past, present and future, we mean that it is present, has been future

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[20] McTaggart, 1908, p. 468.

[21] We could, following Kant, raise this concern *against* McTaggart, since simultaneity is a temporal concept and to say that some event E is simultaneously past, present *and* future assumes the existence of time. 'Only on the presupposition of time can we represent to ourselves a number of things as existing at one and the same time (simultaneously) or at different times (successively)' (Kant, 1781, p. 74). It is for these reasons that Kant took time to be a priori, and imposed by the mind/brain onto a non-temporal reality. McTaggart can escape this charge by employing the C series to show that events are spread out in a series, but this does not count *as* time since it does not involve change. Since two events can take up the same position, they can occur at the same point, whether this counts as time relies on the existence of the A series, which McTaggart rejects.

[22] Little has been made of this version, which may be because the 'vicious circle' argument appeared in the original 1908 paper but was not included when reprinted as chapter 33 of *The Nature of Existence*. Bigelow (1991) alludes to it, arguing that removing the contradiction by claiming that an event is present, will be etc., 'presupposes what we are trying to explain' (Bigelow, 1991, p. 5). Oaklander in several places alludes to it, (e.g. see his 2002, p. 94). Thomson 2001, ignores it as she claims she has not quite understood it (2001, p. 239). The circularity claims McTaggart made in his original paper have on the whole been ignored.

and will be past. But the 'has been' is only distinguished from the 'is' by referring to past existence, whilst we further distinguish 'will be' by referring to future existence. This is clearly circular, for it assumes there to be a past where the determination 'will be' can exist. The same applies to the present and future[23].

More has been made of the second problem, which I call the 'vicious series' argument. This version of McTaggart's Paradox works in quite an intricate way[24]. McTaggart's imagined objector treats the incompatible temporal predicates separately by claiming that some event M *is* present, *was* future and *will be* past. The predicates are only incompatible when held simultaneously.

McTaggart rejects this move on the grounds that we have constructed a second A series into which event M and the first A series fall. To ensure that the three predicates do not apply simultaneously, we introduced a moment in the second A series where predicates in the first A series can be distinguished. Call the moment when M is present, was future and will be past, M^1. The existence of M^1 removes the contradiction in the first A series. So far so good, however, M^1 is itself present, which means it must also be past and be future. In other words, within the second A series, the three incompatible predicates apply to M^1. The response then is to claim that these predicates do not apply simultaneously to M^1. M^1 itself is present, *was* future, and *will be* past, at moment M^2, say. But we have introduced a third A series to remove the contradiction in the second series and the problem remains where M^2 is concerned. McTaggart holds that each move into a further A series merely moves the problem up into that series.

> [The] second A series will suffer from the same difficulty as the first, which can only be removed by placing it inside a third A series. The same principle will place the third inside a fourth, and so on without end.
>
> (McTaggart, 1908, p. 469)

We are forever introducing a higher level A series to escape the problem and this is a vicious regress. McTaggart thinks this proves that the A series cannot be real[25]. What it also means is that the contradiction within the A series still remains[26].

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[23] Oaklander (1998) believes that McTaggart is guilty of employing circular reasoning. Oaklander argues that McTaggart's attempt to reduce the B series to the A series employs temporal concepts, when Oaklander believes that McTaggart is attempting to remove temporal concepts. However, McTaggart is doing no such thing. In his *Nature of Existence*, McTaggart is attempting to provide an error theory to explain our experience of time, which is, McTaggart believes, an illusion. There is nothing in McTaggart's theory that requires us to remove all talk of time, or all temporal concepts. All McTaggart wants us to do is realise that these temporal concepts, whilst legitimately employed, do not indicate in any way a temporal reality. In other words, we can use temporal concepts to develop an account of how the B series reduces to the A series, but these concepts have no ontological commitments to an A-ish, or temporal, reality.

[24] Geach, 1979, refuses to buy into this debate, merely following Wittgenstein by suggesting that a vicious regress more than likely points towards a mistake at the initial stages, rather than a fault that leads to a regress. I believe Geach mistaken here.

[25] It is hard to find the fault in the reasoning here that can be stopped at the initial stage, as Geach suggests. A-theorists rely on stopping the regress at the initial stage, but as we will see in the following chapter, to prevent the regress, the A-theorists rely on the 'vicious circle' argument. One objection brought by Baldwin (1999) is that the 'vicious series' argument only gets started if we take tenses etc., to be qualities possessed by events. "For it is not clear how to make sense of the thought that an event's having one of these qualities [past, present, future] is itself an event that can possess another quality' (Baldwin, 1999, p. 178). If we instead construe these qualities as relations, Baldwin believes we can avoid the problem. Some (e.g. Callender, 2000, Craig 2001) argue that McTaggart's Paradox only applies to 'hybrid' theories (in Callender's terminology) that claim the universe to be best described by the B series, but that events and objects attract A series properties.

[26] Even were we to deny this, we can ask, following Oaklander (2002, p. 55), how the two series are connected? If this relation is non-temporal then this both removes change from the equation, but also

We can summarise McTaggart's argument in the following way:
1. The A Series leads to contradiction, whereby an event is assigned three incompatible predicates simultaneously.
2. The only way to avoid contradiction is to invoke time to explain time; this is both circular and generates a vicious infinite regress.
3. (1) and (2) prove that the A series is not real.
4. The A series is the only series that gives us change, and change must occur if time is to be said to exist.
5. Without the A Series, time cannot exist.
6. Therefore time is unreal[27].

Having looked at McTaggart's argument for the unreality of time I turn now to look at a series that McTaggart thought actually did exist in greater detail: the C series. The C series will do a significant amount of work for my construction of the physically real time, so a clear understanding of it here will act as a foundation for later work. I will conclude that the C series acts as the analytically basic description of time itself.

7. *The C Series Revisited*

McTaggart's C series is a non-temporal serial ordering of events. In Chapter 7 I will construct the C series as determined wholly by a relationship of between-ness. Events are between other events. Moreover, the C series is isotropic: each direction has the same ontological status. If we construct time on the basis of the C series, as I will argue later, then we cannot distinguish ontologically between a past, a present or a future. Nor can we distinguish ontologically between an earlier time and a later time. If the C series is the basic building block of the universe, as I will argue, then the A series and the B series do not explain or describe real ontological time at all[28]. First we need to revisit McTaggart's construction of the C series.

McTaggart thought that we had good reasons to suppose that the C series does actually exist[29]. In his (1908) paper, McTaggart introduces the C series to show how we require both the A series and a non-temporal serial ordering to generate the B series. By doing this we understand the ways in which the A series is more fundamental to time than the B series. Because we need both the A and the C series to generate the B series, McTaggart takes the C series to be at least as fundamental as the A series. 'We cannot get it out of anything else' (McTaggart, 1908, p. 464). It is essential for time that each event is either earlier or later than other events, and this B series cannot be generated by the A series alone. The A series gives us change and direction, but the serial ordering of the B series requires the C series.

McTaggart sees two possibilities for the C series: it is either a non-temporal serial ordering that we mistakenly believe to be temporal; or it is no ordering at all, just a collection of events on which we impose temporality and ordering. Here all events exist in a non-serial jumble, rather like a bucket of tennis balls. To

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entails McTaggart's Paradox, since it will always be true that each position in the A series has all of its A-determinations. If on the other hand the relation is temporal, such that A series' occur in succession, the move is circular, since succession is a temporal concept.

[27] Note that this still leaves us with a real ordering of events, the C series.

[28] This departs a little from McTaggart, who thought the C series real but non-temporal. I will argue later that the C series is our best description of the ontology of time.

[29] McTaggart, 1927, p. 30. I have focused on the argument presented in McTaggart's 1908 article. The arguments over the A and B series in this article and in chapter 33 ('Time') of *The Nature of Existence* are similar, with the notable exception of the dropping of the 'vicious circle' argument. McTaggart's arguments about the 'C' series in chapter 33 of *The Nature of Existence*, have been edited out in some collections of works on time, notably Gale, 1968, and Le Poidevin & MacBeath, 1993. This has the potential to lead to a basic misunderstanding of McTaggart, I contend.

temporalise this collection we take events and sort them into a serial order. McTaggart rejects this second interpretation in favour of the first[30]. The C series is just the isotropic serial ordering of events.

If we take the C series to be analogous to number we can develop the difference here. Take the natural numbers. These are spread out in a series, but that series has what seems naturally to be a preferred direction: from lesser to greater. We start at 1, and move on up to 100, 10,000, and so on: we could also count from 10,000 to 1.

> The first direction seems the more natural to us, because this series
> has only the one end, and it is generally more convenient to have
> that end as a beginning than as a termination.
>
> <div align="right">(McTaggart, 1908, p. 462)</div>

McTaggart thought the C series to be more analogous to the integers. These are spread out in both directions from 0. There is no natural reading of direction here. We may prefer our numbers to increase from 1 to 100 and so on. But the series is spread out from 1 to 1000, and also from -1 to –100. The natural numbers seem to have a more natural reading, but this reading is not necessary, we could read in the other direction should we wish to. Rather than having a more natural reading, the integers just are a serial ordering of numbers. In chapter 7 I will construct the C series in terms of the integers to highlight the conventionality of direction.

In *The Nature of Existence*, the C series takes on an altogether different character and is developed more systematically. The role of the C series in generating the B series is reduced to a mere mention in chapter 33, but the C series itself receives separate treatment. Le Poidevin (1998a) argues that if McTaggart takes time to be unreal, then he owes us an error theory for our experience of time. The C series in *The Nature of Existence* is the focus of the error theory that McTaggart proposes. This theory focuses on perception.

McTaggart argues that we would view time as real whether it were real or not: the unreality of time does not affect the phenomenology of time. That the time described by the A series is an illusion does not entail that *all* the elements in our experience of time are illusory[31]. Our experience of a series in time (A series) may be illusory while our experience is of a real series (C series).

> It is possible that, whenever we have an illusory experience of a
> time-series, we are observing a real series, and that all that is
> illusory is the appearance that it is a time-series.
>
> <div align="right">(McTaggart, 1927, p. 30)</div>

McTaggart says that we have reason to believe that the universe is different to our experience of the universe[32]. He argues that we perceive that the universe has matter and sensa, when all that exists is spirit. McTaggart believes that time is central to explaining why we mistakenly assume our experience is a true reflection of reality. All errors can be traced to perceptions, since perceptions are all that we have in terms of mental states[33]. In his (1909), McTaggart argues that we must think of our perception of things *in time* to be illusory. This illusion has the same character as the illusion we see when we see the Sun at midday to be smaller than the Sun at

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[30] By adopting the first reading, McTaggart can escape the criticism laid at his feet above, whereby his claim that events are simultaneously past, present *and* future, is as circular as claims that they are successive.

[31] McTaggart, 1927, pp. 29-30.

[32] McTaggart, 1927, p. 193.

[33] Since McTaggart develops this claim over two books, I merely point here towards his claims, and set them aside, since they are not central to the issues of time at stake here.

sunset, or where we see a straight stick as crooked when it enters water[34]. All perceptions of things as *in* time are misperceptions.

Behind our misperceptions is a true perception of events in the C series. When I perceive A as being X, I can be certain that A exists and is X *when* I perceive it. This requires that there be a time when I do not perceive A as being X, or rather a position with regard to A and X. A serial ordering of events helps us distinguish between the position where A is X, and positions where A is not X. This is the C series.

> In this case the illusion consists only in our applying the *A* series to it, and in the consequent appearance of the *C* series as a *B* series, the relation, whatever it may be, which holds between the terms of the *C* series, appearing as a relation of earlier and later.
> (McTaggart, 1927, p. 30,)

The C series is real, whilst the A and B series illusions. Since there is a C series then our experience of the time-series will not be entirely erroneous[35]. When we say that A and B are simultaneous, we mean that they occupy the same position in the C series. When we say that M, N and O exist at different times, we mean *no more than* that they have different positions in the series.

To explain why we think that time exists, McTaggart starts with perception. We misperceive something as being *present*. On one side of that perception are (perceptual) events we consider to be *past*, on the other, (perceptual) events we consider to be *future*. If they did not appear in this way they could not appear as being in the B series. But the misperceptions of events as located in the A series imply some sort of serial ordering. These misperceptions alone cannot determine which events are on the same side *of the present* as any other event, and of those on the same side, which is further along that side. To misperceive events in an A series we require there to be a non-temporal serial ordering of those events, given that we require the A series for time and are searching for the source of our error of thinking that time is real. This non-temporal order is the C series[36].

McTaggart takes the C series to be as fundamental to time as the A series to our experience of time. He also thought that in a sense it is more fundamental, for there is a C series in the universe, but no A series. It is possible, therefore, to have a C series independently of time as ordinary conceived. But we can only come to know the C series by working from the A and B series towards it. We do not perceive events in the C series; we seem to perceive events as being in the A and B series' and infer the existence of the C series from them, in the appropriate McTaggart-like way.

We can depart from McTaggart here and argue that we *do* perceive the relationships of the C series and then impose A-ish properties onto those relations. We perceive events as being in the A and B series, as well as being in their C-ish relationships. If the C series just is a series of events between other events, then it seems more natural to say that we do perceive these. That WWII is between WWI and the Vietnam War is something we do perceive, so it seems strange for McTaggart to argue that we merely infer the existence of the C series.

At the heart of McTaggart's philosophy is the C series. The C series has ontological status. If an event is real, it exists at a position in the C series. If we were to have unbiased access to this event, we would only see it as occupying a

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[34] McTaggart, 1909, p. 351.

[35] McTaggart, 1927, p. 30.

[36] This may give us an idea of how the formal structure of imposing the A series on the C series gets us the B series. Since we misperceive an event as present, and delineate between events in the past and the future, then we can start to talk of events being earlier and later than other events.

position in the C series. What we do, however, is misperceive positions within this series as being both *present* (or *past/future*) and as being *before*, *simultaneous* to or *later* than other positions. We mistake events in the C series as events in the temporal A and B series.

8. *Conclusion*

Having set out McTaggart's theory in detail I next turn to look at some reactions to his theory. McTaggart introduced ways of thinking about time that have been highly influential, and have been adopted or rejected. I will be adopting his framework to help reconcile our experience of time, closely aligned to the A series, and our scientific understanding, said to be aligned to the B series, though I will show that it is more closely aligned to the C series. If time is to be real, McTaggart claimed that we need the A series. The B series relies on the A series, and would not be real without it. The A series is contradictory, so McTaggart concluded that it cannot be real. Without the A series, there could be no B series, nor time.

If I am to use a conceptual scheme based on McTaggart, we need to examine it in slightly more depth. I turn to that in the next chapter, where I look at various reactions to McTaggart. Many misunderstand his argument and some of the subtleties he employs seem to be ignored.

Chapter 3
Development of McTaggart

1. Introduction

I intend to adopt the conceptual scheme set out by McTaggart. Central to that scheme is the claim that the A series is essential for the reality of time. McTaggart thought that the A series is essential for the reality of time. His rejection of the A series entailed a rejection of time. I aim to share his rejection of the A series, but deny that this entails the rejection of the reality of time. However, some have argued that McTaggart's theory is incoherent and should be consigned to the scrapheap. It is worthwhile looking at these and showing that such a conclusion is wrong. Others have pointed out less serious flaws, which it would be worthwhile investigating. Looking at the reactions to McTaggart will also help explicate the subtleties in his argument that have dropped out of the debate. One issue that has dropped out of the debate is reality. Many focus on the logic of the A and B series, their relations to each other and so on. However, as Fine (2005) argues, we need an explicit account of what we mean by reality if we are to either deny or assert it. That reality could be *mere reality*, which is not a good account of the fundamental nature of the universe. That reality could be a good account of the fundamental nature of the universe, something Fine calls metaphysical reality.

Gale (1968) thinks that when first confronted by McTaggart's argument many dismiss it as laughable. But once you attempt to get to grips with it, as I have tried here, then 'it dawns on one that McTaggart's Paradox, like the great Zenoian paradoxes, admit of no simple answer' (Gale, 1968, p. 14).

We might be tempted to argue from common sense, as G. E. Moore does, that time must be real, otherwise there could be no temporal facts. If time is not real there could be no temporal facts. There are temporal facts. Therefore time must be real[37]. The argument for the second premiss includes empirical evidence such as 'I am typing this sentence *now*'. My typing occurs later than my breakfast and so on. Gale thinks this a good start. The trouble comes not with rejecting McTaggart's conclusion, but showing exactly where the fault in his reasoning occurs. To reject McTaggart's conclusion that time is not real we have to 'replace McTaggart's account of time by a more adequate one that will not involve this absurd result' (Gale, 1968, p. 15). Fine (2005) might point out that this talk *could* be about mere reality, not metaphysical reality. If so, then Moore's argument is no good guide to the fundamental nature of time. I do not intend here to go through such attempts, but reserve that for the chapters to follow. I look at Gale here only to show that McTaggart has some significant support, and to bolster my claim that McTaggart's argument is not easily dismissed.

2. McTaggart and Change

I will start with those who have challenged McTaggart's account of change, before turning to debates about the operations of the A, B and C series. Geach (1979) thinks McTaggart's argument one of the greatest philosophical arguments. He thinks, in contrast, that McTaggart's claim that there would be no change unless events change (in a particular way) is quite bad. The particular change is A-change, whereby an event changes from being future, to being present etc. If this change were considered itself to be an event then the vicious regress follows. Geach thinks McTaggart here was 'bemused by features of our language' (Geach, 1979, p. 93). McTaggart's mistake lay in regarding tense-expressions to be 'predicable in their

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[37] A standard modus tollens argument: if X then Y; ~Y; therefore ~X.

own right and as standing for certain perceptions or imaginable characteristics' (Geach, 1979, p. 94). Geach prefers tensed verbs, rather than names. Add to these tensed verbs, verb modifiers such as 'it was the case', or 'it will be the case' and we can use A-expressions to describe events without invoking an infinite number of A series.

Geach thinks that McTaggart's second reason for tying change to the A series is far superior. Here change cannot occur 'unless there are logically complete propositions of variable truth value' (Geach, 1979, p. 95). Geach does not say precisely what he means by 'logically complete proposition'. However in the section he refers to, McTaggart says:

> It follows from what we have said that there can be no change unless some propositions are sometimes true and sometimes false. This is the case of propositions which deal with anything in the A series – "the Battle of Waterloo of Waterloo is in the past," "it is now raining." But it is not the case with any other propositions.
>
> Mr Russell holds that such propositions are ambiguous, and that to make them definite we must substitute propositions which are always true or always false – "the Battle of Waterloo is earlier that this judgment," "the fall of rain is simultaneous with this judgment." If he is right, all judgments are either always true, or always false. Then, I maintain, no facts change. And then, I maintain, there is no change at all.
>
> (McTaggart, 1927, pp. 15 – 16)

According to Geach's reading of McTaggart, change occurs when 'X being past' changes from being false to being true. The only change available to temporal language is A-change; the only truth-value variable propositions available are A-propositions. Geach rejects the tenseless, B-theorist, strategy of applying time determinants to tenseless propositions, where 'X is true 'at time T''. He rejects this on the grounds that this language is not part of our basic temporal discourse. In a world without clocks or methods for telling the time, Geach thinks we would still have tensed locutions; but time-determinate B-statements would a) not be obvious in such a world, and b) require an extensive and complex set of empirical facts to support such language. 'True at T' would require accounts of so many rotations of the planet, so much water moving under the bridge and so on.

Geach rescued McTaggart's concept of change by providing a linguistic account of it. I think that we do require a metaphysical/ontological account of change. I suggest two reasons for rejecting an account of change based on language only. First, a linguistic account can be dismissed as mind-dependent; second, we need a metaphysical/ontological grounding to give language some bite.

First, a linguistic account if change could easily be dismissed as a property of language alone, so mind-dependent. We have language with no corresponding mind-independent reality, for such things as unicorns and dodos. Similarly we could dismiss change as a linguistic concept with no corresponding mind-independent object. This is not to say that a linguistic account alone cannot show that change is real. Rather, the claim for the reality of change is stronger if given metaphysical/ontological grounding.

Second, a change in truth value needs to be grounded in metaphysics or ontology if true and false are to apply to statements such as 'X is present'. If 'present' is to mean anything more than tensed-language, then truth values need to have a metaphysical/ontological basis. Whether this be a metaphysics/ontology of truth-makers or facts (or both).

B-theorists claim that tensed language is not sufficient to prove reality is tensed. Similarly a language of change could be considered insufficient to show reality changes. To bolster this claim we need an ontological/metaphysical account.

But if we do make an explicit use of the concept of (assume an ontological) temporal reality then McTaggart's concept of A-change does seem to stand up. If the A series is a true description of time, then event X being present is an event, since X occurs and *is* present. If event X is a car passing a bench then it involves the coincidence not only of the car and the bench in space-time, but also the coincidence of that event with a property, or quality, of time; the present, otherwise we would say that 'X is past/future'. I suggest that we do need to explicitly employ a concept of reality within our theory of time. Mellor (1998) thinks that the use of tenses to discuss time tends to give us the impression that we are only talking about language. But the A series is supposed to be about a feature of the world, not just verbs. Taking tenses to be times tends to conflate the two concepts and distort the debate[38].

Thomson (2001) thinks that McTaggart's account of change is compatible with a B-ish account. As such we do not need the A series for change. I think this conclusion correct, but to charge McTaggart on grounds that *his* concept of change is compatible with a B-ish account, notably Russell's account, is a misreading of McTaggart. As such McTaggart cannot be criticised for failing to notice this.

Thomson rejects McTaggart's account of change, which she takes to be the view that an object changes 'just in case it has a property at one time and lacks it at another' (Thomson, 2001, p. 234). The only property McTaggart accepts that fits this definition is the properties past, present or future. Thomson thinks that McTaggart's view of change can be accommodated into a B-theoretic view of change whereby a poker being hot-at-time T and cold-at-time T^{+1} is sufficient for change. She points at four dimensionalism as a view of change incompatible with McTaggart's thesis that change is an object/event having a property at one time and not at another[39].

Thomson's criticisms of McTaggart seem to rest on a misunderstanding. McTaggart's account of change is not based on an event taking on and losing properties. McTaggart stipulates that change must occur which does not alter the nature of an event.

> Changes must happen to the events of such a nature that the occurrences of these changes does not hinder the events from being the events, and the same events, both before and after the change.
>
> (McTaggart, 1908, p. 460)

A change in properties would change the event, but as we saw McTaggart wants temporal change, which for him involves change in position in a time series, or A-change[40]. An event that gains or loses properties gives us change in the event itself. McTaggart wanted an account of change relevant to a time series. Thomson is mistaken to think change in properties is the change McTaggart is talking about.

The change here is not a change of properties, rather a change in position in the A series. An event changes only when its position in a time series changes. McTaggart takes the nature of an event to mean anything from properties to

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[38] Mellor, 1998, p. 76.
[39] Four dimensionalism is the view that objects are spread out in time just as they are spread out in space. Objects have temporal parts and are not wholly present at each moment of their existence. Above I referred to this as perdurance; the names are interchangeable.
[40] A-change, recall, is an event changing from being future, to being present, to being past and so on.

relations, and seems particularly obscure[41]. He later clarifies this, claiming that the change cannot be a change in qualities since that would alter the event. Rather the change is relational change. According to this account, change is not a change in properties, but a change in relations to properties of time. This is an account of change that can only be rendered in an A-theoretic way. A B-ish account of change cannot challenge this claim. Once an event is earlier than another event it will always be earlier than that event; the B series cannot give us change, so on McTaggart's account is insufficient for time.

Thomson thinks that the B-theoretic view is the better fit with McTaggart's account of change. The trouble is that the account of change she sets up does not seem to be the account that McTaggart adopts. The account of change that Thomson adopts from McTaggart seems to be an account he is considering only to reject. The McTaggart account I have adopted comes from the original 1908 paper, Thomson's target appears in *The Nature of Existence*. However, Thomson's target is not McTaggart's view of change but is Russell's account of change which McTaggart sets out in order to attack[42]; it is not McTaggart's preferred choice. Russell sets out his account as follows;

> Change is the difference, in respect of truth or falsehood,
> between a proposition concerning an entity and a time T and
> a proposition concerning the same entity and another time T'.
>
> (Russell, 1903, p. 469)

Take a statement 'the poker is hot'. Russell believes that change happens when this statement, true at time T, becomes false at time T^{+1}. McTaggart provides the following example;

> [Change has occurred on] Mr Russell's view, if the
> proposition "at the time T my poker is hot" is true, and the
> proposition "at the time T' my poker is hot" is false.
>
> (McTaggart, 1927, p. 14)

McTaggart cannot agree with this account, since it would involve *no change*.

> If, with Mr Russell, we reject the *A* series, it seems to me that
> change goes with it, and that therefore time, for which change
> is essential, goes too. In other words, if the *A* series is
> rejected, no proposition of the type "at the time T my poker is
> hot" can ever be true, because there would be no time.
>
> (McTaggart, 1927, p. 14)

McTaggart's account of change is not compatible with Russell's. Thomson sets out Russell's view as one McTaggart adopts, but this is a misrepresentation. McTaggart rejects this view. McTaggart sets out his account a few pages earlier, updating the above quote. McTaggart asks what characteristics of an event can change. His answer is that the only characteristics that can change without changing the nature of an event are A-changes; i.e. positions in the A series[43]. Consider again the death of Queen Anne. This has the characteristics of being a death, of being the death of Anne Stuart, of having particular causes and effects and so on. Were these to change then the event itself would change. To remain the death of Queen Anne, the event must not alter. The only change possible then is the change of that event's position in time. As we have seen, this can only be provided by an A series.

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[41] I have used 'nature' to refer to properties etc., of an event. McTaggart uses 'characteristic' instead which he takes to be 'a general term to include both the qualities which the event possesses, and the relations of which it is a term' (McTaggart, 1908, p. 460).

[42] McTaggart, 1927, p. 15.

[43] McTaggart, 1927, p. 13.

Thomson is correct to pick up McTaggart on change, as it is, I believe, his weakness. But her target is not McTaggart's view. The problem with McTaggart's view on change is that it seems to *assume* that only the A series can give an account of change in order to show that the A series is the only series that can give an account of change. He assumes that change is a change in position *in* time to show that any series that cannot account for that change in position cannot constitute time. It seems circular, but is it? McTaggart claims that any change in the properties of an event constitutes a change in that event, so we would not be talking about that event, such as the death of Queen Anne, but some other event. The only change in an event that can occur is a change that does not alter the properties of the event. So the only change must be relational. Given that we are talking about time, the only change available seems to be McTaggart's conclusion, that change occurs only when an event changes its position in the A series. As such, the suspicion of circularity remains only a suspicion.

Criticisms of McTaggart based on his account of change can be questioned. Next I look at those who think that McTaggart was mistaken in his construction of the relationship between series. I will return to Thomson, who again misrepresents McTaggart, largely based on her misrepresentation of his account of change.

3.   *Relations between the A and B Series*
Problems have been raised about McTaggart's attributing priority to the A series over the B series. Corish (2005) thinks that McTaggart failed to correctly identify the conceptual priority of the B series over the A series. Corish draws conclusions about ontological priority from the conceptual priority. This ignores McTaggart's focus on change as the determining factor for the ontological fundamental status of any series. Thomson attempts to address this claim, arguing that the B series can give us an adequate account of change, thus giving priority to the B series *over* the A series. I will argue that the most we can draw from these conclusions is that the A series and B series *could* be taken to be conceptually and ontologically equivalent, which means we could take either series to take priority over the other.

Corish thinks that McTaggart was fundamentally mistaken to distinguish between the A and the B series. Corish thinks that there is only the one series and that the fundamental concepts are B-concepts. If something is past, it has to be earlier, if it is future it *has* to be later. But an event can be later, but in the past. The death of McTaggart is later than the death of Queen Anne, but both are in the past. Corish thinks this sufficient to show that the B series is the fundamental description of the one series. '[What] is past is always earlier, what is future always later. The A arrangement must allow, and conform itself to, the logic of the B series' (Corish, 2005, p. 83).

Corish argues that the B series is conceptually fundamental, whereby we need the B series to understand the A series. Conversely, we do not need the A series to understand the B series. However, we *could* argue the reverse, where the logic of the B series follows the A series. The concept of being earlier can be got out of 'being past', for example. By contrast, there seems to be no way to get the past out of earlier. As Corish notes, something can be earlier, but in the future. Christmas 2007 is earlier than Christmas 2008, though both are in the future. Nor can being later give us future, since Christmas 2005 is later than Christmas 2004, but both in the past. I think conceptually that each series *could* be understood in the other series' terms. McTaggart thought that the A and B series were equally essential for time. He seems to claim, though in a confusing manner, that they are equal. Corish thinks

the B series conceptually prior, but I suggest that they are equally basic. This however does not imply that they are ontologically equal.

Corish believes that ontologically the A series requires the B series, but the B series does not require the A series; if it does turn out that the world is A-ish, it follows, by the logic of the series, that the B series exists. But if the world turns out to be B-ish, the A series does not follow. So the world is B-ish, since if it is B-ish it is B-ish, and if it is A-ish it has to be, at a prior level, B-ish. He thinks McTaggart mistaken for not recognising the direction of dependence within this relationship. McTaggart thought the A series ontologically more fundamental because it is the only series that gives us change. Corish stays within the logic of the series, and staying within logic misses McTaggart's point here. Were we to stay within logic, then the A and B series would be equal, I suggest, with no conceptual or ontological priority placed on either series. To charge McTaggart of this is a little harsh because McTaggart steps out of the logic and into ontological claims about change. The priority of a series is not based on the internal logic of any temporal series, but on which series gives us an adequate account of change. Corish misses this point and leaves us with two conceptually equal series.

Corish places priority on the B series because of a perceived conceptual priority that I deny exists. Thomson (2001) also thinks that the central series is the B, *not* the A series. She does this by combining a criterion of identity with what I think is a dubious reading of McTaggart which takes him to allow for the possibility that the B series *could* be sufficient for time. This is compounded by her misunderstanding of McTaggart's account of change.

Thomson compares the identity between events in the A and B series with the identity between squirrels in the Happy Squirrel Series and the Fat Squirrel Series[44]. Suppose there are two squirrels in my yard, George and Mildred, and that George is happier than Mildred. We then have a series that we can call the Happy Squirrel Series. We can describe this series in the following way: one, its members are squirrels in my yard, and two, one squirrel proceeds the other in the series just in case one is happier than the other. Suppose George is fatter then Mildred. We then have a series that satisfies the Fat Squirrel Series, whereby: one, its members are squirrels in my yard, and two, one squirrel proceeds the other in the series just in case one is fatter than the other. Thomson follows standard identity conditions for series to say that these two series are in fact the same series, described in different ways. There are only the two squirrels, but their description in terms of serial ordering alters. Were George and Mildred to be the same weight, we would only have the one series.

Thomson thinks that we have the one series, because there are only two members and they have the same order in both descriptions. However, as pointed out above, had George and Mildred been the same weight, we would have only the one series. What would happen however, if George was happier than Mildred but Mildred fatter than George? We now *would* have two series. We have two members but they are not in the same order. It seems just a happy coincidence in all cases that the weight and happiness of the two squirrels enables us to generate one or two series. Were George to become depressed we would move from two series to one series.

However, these descriptions can vary and this is because the squirrel series are not a natural series. We are choosing properties by which to place George and Mildred into a serial order. Two squirrels in my yard are not naturally a series, they are two animals which we place into a series. Thomson chooses happiness and

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[44] Thomson, 2001, p. 230

weight as her criterion. Happiness is a difficult property to nail down, so let us change the example to properties of age and weight. Suppose George is older than Mildred but Mildred thinner than George. We have two series here. Two series that can change into one were the squirrels to alter weight. Ranking the order of squirrels seems to be arbitrary.

Thomson introduces these series to get to the concept of series identity. She sets out a criterion of identity, where 'series S is identical with series S' just in case they have the same members, and their order in S is the same as their order in S'' (Thomson, 2001, p. 233). The Happy Squirrel and Fat Squirrel Series have the same members and their order is the same. Thus the Happy Squirrel and Fat Squirrel Series are really descriptions of the same series. She now applies this criterion to the A and B series.

The order of events in the A series is the same order as that of events in the B series. Thomson claims that it follows from this that since the A and B series have the same events and those events are in the same order that 'the A series just is the B series' (Thomson, 2001, p. 233). Take three events, WWI (X), WWII (Y) and the Korean War (Z). X, Y, and Z form a natural series, one we could describe in either A-ish or B-ish terms. X, Y, and Z are the members of the series, and the order of that series is X, Y, Z. It seems that we have here one series. We *could* say that X is earlier than Y and Y is earlier than Z. Alternatively, we *could* say that X is past, Y is present and Z is future. Thomson thinks these two descriptions of X, Y, and Z are descriptions of the same series. These series have the same members and their order in the A series is the same as their order in the B series.

Assume for the moment that she is right, (I think she is wrong and will turn to that shortly). We have two series descriptions for the same events. We need to decide which description is the more accurate one. Working within McTaggart, remember that our description has to allow for change, and change *within* the series not *of* the events. McTaggart thinks that our criterion for deciding which series description is this concept of change[45]. McTaggart concluded that the appropriate series description if that series is to be a *temporal* series is the A series. Event X changes within the A series by being future then present and then past. Thomson provides three reasons to prefer the B series as the time series. She thinks the B series sufficient for time; she thinks that McTaggart provides no argument in favour of the A series and that McTaggart *could* be taken to prefer the B series.

First she thinks that the B series description is enough to give us time and asks why 'doesn't the existence of the B series suffice for the existence of time?' (Thomson, 2001, p. 231). She does not explain further why we ought to accept the existence of the B series as sufficient for time. The mere existence of the B series is enough. This I think correct but in need of further support. At this stage of her argument all we have is the assertion that the B series is enough to give us time. She does not answer her own question above, for example.

Thomson's second reason for privileging the B series is questionable; she thinks McTaggart does not give an acceptable answer to the question of why time relies upon the A series. Thomson ignores McTaggart's arguments for the A series and against the B series. As we saw in section 2, Thomson thought McTaggart's account of change compatible with the B-ish account of Russell, yet this was not McTaggart's account of change. McTaggart argued that the characteristics of an event changing would change the event, not the event's position in time. He thought that indexing Russell's account of change showed that there really was no change, *in position in time*. The change required for the reality of time is *change in position in*

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[45] I am speaking for McTaggart here; he did not put his case in this way.

time, and the only series that accounts for this is the A series. This is a pretty clear argument in favour of the A series and one against the B series. Yet Thomson thinks McTaggart makes no such claim. The second claim is explicitly rejected by McTaggart when he writes that if the A series were not real 'there would be no change, and consequently the B series by itself is not sufficient for time, since time involves change' (McTaggart, 1908, p. 461).

Thomson's third reason for preferring the B series is a perceived, on her part, acceptance by McTaggart that the B series *could* be sufficient for time. She thinks that McTaggart *could* have relied upon the A series because he thought it implausible that the B series is sufficient for time. She thinks his intuitions about the sufficiency of the B series as an account of time were not fully worked out. In some areas she takes McTaggart to say that the B series *could* be sufficient for time. She quotes from McTaggart, yet the quote shows that McTaggart thought the B series relied on the A series and this is not saying that the B series is sufficient for time. McTaggart argues that

> The *B* series, however, cannot exist as temporal, since earlier
> and later, which are the relations which connect its terms, are
> clearly time-relations. So it follows that there can be no *B*
> series when there is no *A* series, since without the *A* series
> there is no time.
>
> (McTaggart, 1927, p. 13, original emphasis)

Thomson provides this quote on page 232 of her article, but goes on to conclude that we should attribute to McTaggart the belief that 'the existence of the B series would suffice for the existence of time' (Thomson, 2001, p. 232). Yet this is contradicted by the very quote that Thomson used to justify such a conclusion.

Thomson provides three reasons for the B series being more fundamental, and the correct description of time. First, she thinks that the B series more fundamental but provides no support for this claim. Second, she thinks McTaggart provides no argument for the fundamental nature of the A series. He does. McTaggart relies on the possibility of change of position within a series to decide which series is the more fundamental time series. He rejects the B series because events once in that series stay in the same position within that series. Events only change their position in the A series, where they move from the future to the past. Third, Thomson thinks McTaggart *could* be taken to prefer the B series, but this rests on a misunderstanding. McTaggart may canvas this option but rejects it because of his criterion of change.

Let us return briefly to Thomson's criterion for the identity of series. I said that I thought she was wrong about the A series and B series being identical. Take our three events, X, Y, and Z. X is earlier than Y and Z. X is past whilst Y is present and Z is future. She claims that since these descriptions have the same members in the same order they are descriptions of the same series. Thomson focuses on the place of events in a series. I think we ought to consider the relationships involved in those series. The B series involves relationships between events. X is earlier than Y and Z, whilst Y and Z are later than X. This relationship is between events only. The A series involves relationships between events *and* privileged moment in time. X is past whilst Y is present and Z is future. This description has the same members whose order is the same. However, their relationship is different. The relationship is not solely between events, but between events and time, notably the past, present and future. If so, then there is something in the A series description not covered by the B series description[46]. The A series

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[46] As we will see in chapter 6, this mirrors the A-theorist criticism of the B-theorist's attempts to translate A-language into B-language. Translating A-language into B-language loses critical properties.

involves relationships between events in that series and between those events and A-time. The B series involves relationships between events in that series and between those events and B-time. The series no longer have the same members, even though they have the same events in the same order. If this works then Thomson's identity criterion shows that the A series and B series are different, not the same as she claims.

Criticisms of McTaggart based on his 'failure' to recognise the priority of the B series over the A series (whether that priority be logical conceptual or ontological) fail. At best we see that they are conceptually equally fundamental. McTaggart states this when he claims that the A and B series are equally basic, and I take this basic to be conceptual. He then argues that the A series is fundamental, which I take to be ontological, based on his account for change. This can be challenged, as we saw.

4.   *The Logic of the A Series*

McTaggart purported to show that the logic of the A series leads to a contradiction. Recall the regress I developed at the end of Chapter 2 (p. 26) to represent how McTaggart's Paradox could be taken to operate.

1.   Every event is past, present and future;
2.   No event is past, present and future simultaneously, rather an event *is* present, *was* future and *will be* past. Therefore there is no contradiction in the A series.
3.   (2) assumes the existence of time so counts a circular.

From this we could conclude that:

4.   The A series cannot consistently explain time without circular reasoning.

Some have argued against this. Prior (1967) follows Findlay in claiming that the apparent inconsistency of the 'vicious series' argument should just be treated as 'laws of the complicated but far from chaotic logic of the A series' (Prior, 1967, p. 9). I will turn to look at the tradition of this response in the next section. Here I just wish to set out the logic of the A series, as identified by McTaggart.

McTaggart's logic seems to run in the above format as well as the following:

1.   Every event is past, present and future;
2.   No event is past, present and future simultaneously, rather an event *is* present, *was* future and *will be* past;
3.   (2) requires the introduction of a moment M, when event E *is* present, *was* future and *will be* past;
4.   In turn moment M is past, present and future;
5.   Moment M is not past, present and future simultaneously, rather it *is* present, *was* future and *will be* past;
6.   (5) requires the introduction of a moment M^1, when event E *is* present, *was* future and *will be* past;
7.   In turn moment M^1 is past, present and future;
8.   So on to infinity.
9.   The A series involves a vicious infinite regress.
10.   The A series cannot consistently explain time without introducing a vicious infinite regress.

McTaggart takes circular reasoning and a vicious infinite regress to indicate that the A series does not exist.

This seems to be the logic of the A series, as set out by McTaggart. This has been challenged and I turn to look at these challenges in the following section. We will find that most of the challenges seem to unwittingly fall into the first characterisation, which is the logic of the 'vicious circle' argument. The second

characterisation is the 'vicious series' argument. Most think the first move escapes the second, and thus fail to solve McTaggart's Paradox, just repeat it.

5. *The Removal of McTaggart's Paradox*
Since McTaggart identified the logic of the A series there have been a number of attempts to reject his conclusions that the A series is fundamentally inconsistent. I will look at such moves here, starting with Christensen's modernisation of C. D. Broad's arguments. Most unwittingly adopt the 'vicious circle' argument to resolve the 'vicious series' argument. Before turning to these it would be worth reminding ourselves of these two arguments:

The 'vicious circle' argument:	time is assumed to explain why 'past', 'present' and 'future' do not apply simultaneously.
The 'vicious series' argument:	a second time series has to be introduced to separate these terms; but to separate these terms within this second series we need to introduce a third time series and so on.

The arguments currently available only address the 'vicious series argument' and fall prey to the 'vicious circle' argument. Since they rely on the 'vicious circle' version, McTaggart's Paradox has not been removed.

Broad (Christensen)
Broad (1938b) thinks that the source of McTaggart's Paradox, is the use of the 'is' in the claim that every event is past, present and future. If you take this 'is' to be tenseless (or timeless in Broad's terms), then you are forced to conclude that if an event *is* present, it must also be '*is* past', since the '*is*' applies at all times, if an event occurs, the description of that event as '*is* past' will always be true, since the '*is*' applies at all times; this gives us an event that '*is* present' and '*is* past' and the contradiction begins. Broad accepts that this is impossible but thinks that it impossible for an event to be past *and* present because it is only past *and* present in succession.

A modern version of Broad can be found in Christensen (1974), who thinks McTaggart's argument is 'so outrageous that it should long ago have been interred in decent obscurity' (Christensen, 1974, p. 289). Christensen lays a two-step charge at McTaggart's feet. First, following Broad (1938b), he thinks that there is no contradiction in the A series[47]; second, since there is no contradiction in the first A series, no infinite and vicious regress gets started. It is a fact of grammar, Christensen believes, that A-predicates such as 'past', 'present' and 'future' are accompanied by a tensed copula. That an event, X, is past, is present, and is future relies on the 'is' being tenseless. But if the 'is' remains tensed, then the contradiction disappears. Event X is no longer present tenselessly, as well as past and future tenselessly. Event X *is* present, where the italicised *is* refers to a tensed 'is'. X then becomes '*is* past' and so on. Since X is never tenselessly past, present and future no contradiction follows. The second step merely rests on the fact that there is no need to introduce a second A series, since we do not need to remove a contradiction from the original A series; for it does not exist. I will turn shortly to set out McTaggart's response to this. McTaggart essentially argues that employing a

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[47] Broad (1938b) sets out this type of linguistic reasoning in these terms 'If the word "is" in it [a claim that event X is present] were a non-temporal copula, *every* utterance by me of the same sentence would record the same fact, no matter whether it were earlier than, contemporary with, or later than this utterance of mine' (Broad, 1938b, p. 272).

tensed 'is' involves time. Using a tensed 'is' therefore counts as circular. But first, I will set out the rest of Christensen's argument.

Christensen thinks that McTaggart actually creates the regress, rather than brings it out through analysis.

> It is McTaggart himself who begins the regress, trying to get rid of the tense in the copula 'was' (in 'was future') by replacing it with the pre-propositional phrase 'at a past time'. But it is then discovered that the latter expression involves yet a further tensed copula: 'at a past time' means 'at a time which is *now* past'. Again it is McTaggart who must push the regress another step forward in the attempt to de-tense the A-predicate in the added propositional phrase, by adding *yet another* propositional phrase of similar form.
>
> (Christensen, 1974, p. 291)

Christensen here charges McTaggart with fabricating the 'infinite and vicious' regress. This is because McTaggart replaces a tensed *is*, in 'X is present' with a tenseless version, which implies that X is (always) present; similarly for 'X is past' and 'X is future'. So called 'A-predicates' are, Christensen believes, really sentential modifiers. The root of McTaggart's mistake is that he tried to fit these sentential modifiers into the subject-predicate structure of our language[48]. Time, however 'refuses to fit comfortably into a linguistic and conceptual pattern that appears to work so well for everything else' (Christensen, 1974, p. 299).

Were McTaggart to rely solely on the 'vicious series' argument for the generation of his contradiction then I think Christensen (and Broad before him) would be accurate. However, McTaggart also has the 'vicious circle' argument and this suggests, if we stick to our bias that temporal terms do fit in with the subject-predicate nature of our language, that the tense of the 'is' in 'X is present/past/future' has to be tenseless, otherwise circularity results[49]. As briefly mentioned above, if the 'is' is tensed and related to reality, then we seem to rely on the dynamic nature of A-time to explain time itself. Time is invoked to explain the A series but we introduced the A series to explain time. McTaggart thinks this move clearly circular. If so, then Christensen has used circular reasoning to remove the contradictions in the A series. Christensen then uses this move as part of his claim that McTaggart created the regress.

Prior (1967) points out that McTaggart's assumption seems to be that 'the strictly present-tense 'is' *must* be explicated in terms of a *non*-temporal 'is'' (Prior,

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[48] Note that if we follow Christensen's thoughts here he seems to rely on agreeing with McTaggart's conclusion to deny McTaggart's argument. To deny that A-expressions are predicates and so refer to a subject he has to deny that time is real to show that A-expressions are sentential operators, the way that modal terms are sentential operators. We have to deny the reality of time to show that A-expressions are not predicates. Prior (1968) argues that grammar fools us into thinking that tensed language involves nouns or predicates; tensed language instead of being taken as predicates or verbs should be taken as adverbs, because that is exactly how they behave. Christensen thinks we tend to assume our language has an underlying ontology, but this need not be the case.

[49] Retaining the subject-predicate system helps imply that our language is *about* something other than the words, but also about that which the words refer to. Within the subject-predicate structure the 'subject' assumes that there is something to which the predicate attaches. 'X is present' comes across as a statement *about* X, not just about the word X. Whether such language has ontological commitment is one thing, taking our language to refer to non-linguistic things is another. The subject-predicate system indicates an ontology, whether such indication is justified or not; the non-linguistic referents could have no ontological status but this does not detract from the claim that our language refers to something non-linguistic.

1967, p. 6, original emphasis). It is this assumption that leads to the contradiction[50]. Christensen and Prior think that McTaggart's problems are based on this assumption. However, it may be the case that the 'is' has to be tensed if time were real, but until it has been shown that time is real the 'is' ought to remain tenseless; this is the point of the 'vicious circle' argument. To claim that the 'is' here is tensed is to assume the existence of time to prove that time exists. The A series was introduced to explain time so cannot assume time as a key part of that explanation. Christensen's insistence that the 'is' remains tensed ignores this. As a result, his attempt to consign McTaggart to history ignores a key aspect of 'McTaggart's aborted paradox' (Christensen, 1974, p. 298).

Christensen has an escape if we follow him by taking A-expressions to be sentential operators in the same way that modal terms are sentential operators. Here there is no ontology underlying our language and the claim to circularity seems to lose its force. We do not assume time to explain time, rather we show that the 'is' here is a structure of our language and merely modifies our sentences[51]. But adopting this view does not force a rejection of McTaggart.

Mellor (1998) thinks that claiming the 'is' in 'X is present' is tensed may seem to remove the regress from the A series. However, it achieves this by moving the regress *into* the sentence itself. 'X *is* past' really means that 'X is *now* past', and we still have to determine whether the 'is' in this sentence is tensed or tenseless. If it is tenseless then McTaggart's regress begins. If it is tensed the sentence becomes 'X is now *now* past', and we then have to determine whether the 'is' in *this* sentence is tensed. If not then McTaggart's regress begins. If it is tensed then we have 'X is now now *now* past', and we have to determine whether the 'is' in this sentence is tensed or not… and so on. Broad (1938b) argues that taking the 'is' to be tensed does not remove the temporal nature of the statement and leaves us with the problem of analysing that statement in tensed or tenseless terms. Again, if we try and analyse it in tenseless terms, the contradiction re-enters the scene and the regress starts. If we try and analyse it in tensed terms we reintroduce the problem at a higher level, and the regress begins again. If Mellor is correct then Christensen has replaced McTaggart's regress with one of his own, and failed to eliminate it. Mellor here applies McTaggart's reasoning to temporal sentential operators and demonstrates that adopting this strategy as Christensen does, merely changes the focus of the regress and does not remove it. I think Mellor's criticisms are accurate here, and that Christensen has replaced one regress with another.

Broad and Christensen's attacks fail, since they either unwittingly rely on the 'vicious circle' argument or merely move the regress. Prior (1967) argues in similar ways, though thinks there nothing extraordinary about this; it is just a feature of an attempt to turn an A series *into* a B series. In other words, the A series seems to be described in tenseless terms and this is the source of McTaggart's problems.

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[50] Prior (1967) also thinks that there is no problem with the logic of the A series, it is when McTaggart attempts to turn it into a B series that problems arise, (Prior, 1967, p. 6).

[51] Mellor (1998) follows McTaggart in applying A-times to events and not treating them as modal operators. He thinks that even so, the difference involved is at best negligible. 'Facts are no better than events at being both and not both past and present, present and future, etc.' (Mellor, 1998, p. 75). We might develop Mellor's thought here by suggesting that the analogy that it is possible that event X is past, and that it is possible that event X is present, is not quite right. This does not get Mellor the contradiction he wants. Rather the analogy should be that it is possible *and* it is not possible that event X is past, etc. Here the contradiction occurs within the modal setting because it occurs with X being possible *and* not-possible. As Mellor notes, nothing, whether it be events, facts, propositions etc., can have 'mutually incompatible properties' (Mellor, 1998, p.76)

Prior

        Prior thinks that the underlying assumption behind McTaggart's argument is that the 'has been', 'will be' and 'is now present' must be explained in non-temporal ways. A non-temporal 'is' attaches an event, or moment, to another moment. Prior thinks that were we to attempt to talk of an event, not in terms of being past, present and future, but in more careful ways then we will fail to remove the temporal nature of the A series. We could change 'X has been Y' to 'X's being Y is past', and 'X will be Y' to 'X's being Y is future'. The 'being' in these phrases is present-tensed which means that McTaggart's problems remain. Take three tensed ways of describing X:

        1.   X has been Y
        2.   X will be Y
        3.   X is Y

Prior thinks the regress gets started when we attempt to convert these into:

        1a.   'X being Y' at some past moment
        2a.   'X being Y' at some future moment
        3a.   'X being Y' at some present moment

But the 'being' here can only be understood in some temporal sense. We also restate the regress in the form of moments rather than events.

        Prior identifies three steps to the regress (to start with). First, we state that some moment or event (X) is past, present and future. This is obviously wrong, so we attempt to correct it, where X 'either *is* future, *will be* present and past, or *has been* future, *is* present and *will be* past, or *has been* future and present and *is* past' (Prior, 1967, p. 5, original emphasis). This is right but cumbersome. The second step expands this to something wrong, whereby the moment when X *is* future, *will be* present and past (X^1) is itself past, present *and* future. This then gets corrected into something even more complicated, where X^1 either *is* future, *will be* present and past, or *has been* future, *is* present and *will be* past, or *has been* future and present and *is* past. Step three introduces X^2 where X^1 is past, present *and* future, and so on.

        Prior denies that this is a vicious regress, claiming that were we

> Compelled to move forward in this way, we only get contradictions half the time, and it is not obvious why we should regard these rather than their running mates as the correct stopping-points.

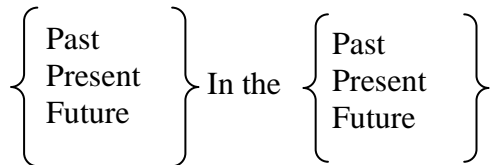   (Prior, 1967, p.p. 5 – 6)

Prior asks why move onwards when we can stop at the corrected stage? Like Broad before him, Prior thinks McTaggart's problems arise by employing a tenseless 'is'. Explicating tensed language in terms of some non-temporal 'is' leads to the contradiction. Prior thinks there nothing disastrous about this. 'It is simply the nature of an A series as McTaggart himself describes it' (Prior, 1967, p. 6). The contradiction arises by trying to turn the A series into a B series. Broad follows Findlay in claiming that rather than complaining about the nature of the A series, we ought to accept it as the results of a chaotic logic of that series.

        This is rather a 'so what?' response. Prior thinks we can choose to stop the regress at a consistent point. He claims that we have no reason to choose the inconsistent over the consistent. However, neither do we have a reason to prefer the consistent to the inconsistent. Unless we have a compelling reason to favour one over the other then it is slightly more obvious what we ought to regard the regress as vicious. Prior thinks this just the nature of the A series, perhaps as a result of reading the 'is' in a timeless way. But as we saw above, McTaggart had good reason to read the 'is' in this tenseless way; it avoids the 'vicious circle' argument.
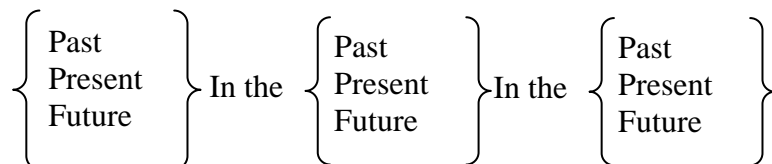
Dummett

Dummett (1960) seems impressed by McTaggart's reasoning and develops McTaggart's 'vicious series' argument in the following way[52]. We note that 'past', 'present' and 'future' are incompatible predicates, but that each applies to every event. The response that every event '*will be* past', '*is* present', and '*was* future', and that these predicates are not incompatible, only serves to introduce nine predicates each of which applies to every event, some of which are incompatible. Dummett calls 'past', 'present' and 'future' 'first level predicates'. To remove the contradictions of the 'first level predicates' we must introduce 'second level predicates' and there are nine of these:

$$\left\{ \begin{array}{c} \text{Past} \\ \text{Present} \\ \text{Future} \end{array} \right\} \text{In the} \left\{ \begin{array}{c} \text{Past} \\ \text{Present} \\ \text{Future} \end{array} \right\}$$

These give us nine predicates, *some* of which are incompatible. To see this we should work out the nine predicates:

Past in the Past	Present in the Past	Future in the Past
Past in the Present	**Present in the Present**	**Future in the Present**
Past in the Future	Present in the Future	Future in the Future

Take these predicates to apply to event M. Focus on the middle (**boldface**) row. This row tells us is that event M is past in the present, is present in the present and is future in the present. This is just a convoluted way of saying that M is past, present *and* future: McTaggart's contradiction is reasserting itself. To remove the contradictions in these 'second level predicates' we must move to 'third level predicates', and there are 27 of these:

$$\left\{ \begin{array}{c} \text{Past} \\ \text{Present} \\ \text{Future} \end{array} \right\} \text{In the} \left\{ \begin{array}{c} \text{Past} \\ \text{Present} \\ \text{Future} \end{array} \right\} \text{In the} \left\{ \begin{array}{c} \text{Past} \\ \text{Present} \\ \text{Future} \end{array} \right\}$$

This will continue ad nauseam. But, Dummett argues, at any level of predication the three predicates

$$\left\{ \begin{array}{c} \text{Past} \\ \text{Present} \\ \text{Future} \end{array} \right\} \text{in the present … in the present … in the present …}$$

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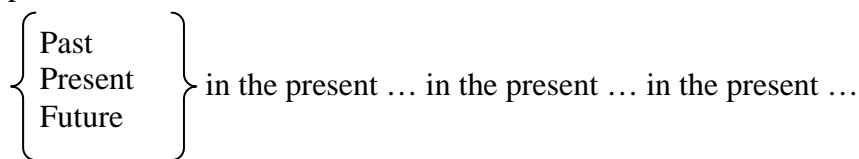
[52] This construction of McTaggart's theory by Dummett has been challenged. Barry Taylor (1997), for example, argues that nothing resembling Dummett's reasoning can be found in McTaggart's *Nature of Existence*, (Taylor, 1997, p. 184). That McTaggart did not use this reasoning is no proof that Dummett's reconstruction of it is false. Dummett's account suffices to show how one form of McTaggart's Paradox works. Genevieve Lloyd (1977) takes Dummett to misrepresent McTaggart. Dummett's hierarchy does not fully capture the regress of McTaggart. In Dummett, the hierarchy is only formed by adding 'in the past', and 'in the future'. Without the inclusion of 'in the present', the very contradiction Dummett is trying to elucidate gets removed. Yet Dummett did introduce past, present and future in his defence so I confess to not understanding how Lloyd has missed this. I do not intend to enter this debate here. I merely introduce Dummett's construction to further elucidate the contradiction that arises within the A series.

are equivalent to the 'first level predicates' 'past', 'present' and 'future'. The middle row always involves McTaggart's Paradox in its 'vicious series' version. This means that invoking such predicate levels has not removed the contradiction.

Dummett sets out this account as the second of a two-step argument. The first step involves, as we have seen, the claim that there would be no time without the A series. Dummett puts this in terms of token-reflexives. A-facts are 'facts into the statement of which temporally token-reflexive expressions enter essentially' (Dummett, 1960, p. 500). Unless we have to use temporal token-reflexives to describe reality there could be no time. Lloyd (1977) takes Dummett to claim that anything real must be capable of a complete description. The unreality of time follows from the fact 'that a temporal reality is intrinsically incapable of a complete description' (Lloyd, 1977, p. 433).

I set this out in greater detail in section 7 below so set it aside for the moment[53]. Here I am just interested in explicating the 'vicious series' argument through Dummett. Dummett's reconstruction of the 'vicious series' version of McTaggart's Paradox can help us understand how the contradiction remains even when moving to higher levels of analysis[54].

Mellor

It is worth also looking at Mellor's account of McTaggart, for it will help identify an underlying logic in the challenge I will set those who wish to adopt the A series as an account of time. Mellor's account developed over time, bringing it into closer alignment with McTaggart.

Mellor (1998) sets out McTaggart's proof of the unreality of time in terms of A-times[55]. Take P, N, F, to represent respectively, Past, Present (i.e. *now*) and Future, and e to represent our key event. '~', '&' and '→' are translated as 'not', 'and' and 'entails'. McTaggart's argument comes out as follows, for our event e, P, N and F are mutually incompatible, giving us:

$$P e \rightarrow {\sim} N e; \quad N e \rightarrow {\sim} F e; \quad F e \rightarrow {\sim} P e; \text{ and so on.} \tag{1}$$

If e is past it cannot be present; if e is present it cannot be future; if e is future it cannot be past; if past e cannot be future and so on. However, McTaggart argues that every event has them all, which comes out as:

$$P e \text{ \& } N e \text{ \& } F e \tag{2}$$

But (1) and (2) cannot both be true. However, our concept of A-times commits us to (1) and (2). If so, then we seem committed to contradiction since (1) shows that $P e \rightarrow {\sim} N e$ and (2) commits us to $P e$ & $N e$. Thus A-times cannot be true of reality.

The common sense response to this is that no event e has these incompatible A-times simultaneously; event e *will be* past, *is* present, and *was* future. There is no contradiction after all. Here (1) comes out as true, and (2) gets replaced by

$$\text{FP} e \text{ \& } N e \text{ \& } \text{PF} e \tag{3}$$

Mellor interprets McTaggart as responding that whilst (3) is simple; there are more complicated A-times. 'Specifically, there are also PP and PN, FF and FN, and NP, NN and NF' (Mellor, 1998, p. 74). If any event has one of these complex A-times, it

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[53] See pp. 43 – 45.

[54] Taylor (1997) thinks that Dummett's construction of McTaggart's argument places far greater emphasis on the 'vicious series' version and has distorted the debate somewhat. Dummett placed far greater emphasis on this than McTaggart himself did. Dummett's reading of McTaggart has been so influential that the discussion of McTaggart's argument 'has concentrated on the hierarchy of tense levels, without acknowledging the relatively minor place which the hierarchy played in McTaggart's own development of his argument' (Taylor, 1997, p. 186).

[55] In his (1981) Mellor talks of being committed to changes in tense, but alters this to talk of changes in A-time in his (1998) which brings his argument more in-line with McTaggart's.

has them all. Suppose event *e* has a simple A-time, it is obvious that it has that A-time *now* giving us:

$$Pe \rightarrow NPe; \quad Ne \rightarrow NNe; \quad Fe \rightarrow NFe.$$

Event *e* being Past entails that it is now past; event e being now entails that it is now now and so on. So event e seems to be past, present and future. The story gets more complicated whereby whatever is past, *was* present and *was* future, giving us:

$$Pe \rightarrow PNe; \quad Pe \rightarrow PFe; \quad Pe \rightarrow FPe.$$

What is sufficiently past is also past in the past, since two days ago was past yesterday. The same applies to the future, since what is sufficiently future is also future in the future; next month is also future tomorrow and so on, giving us PP, FF. Instead of the three simple A-times P, N, F, we have nine compound A-times, PP, PN, PF, NP, NN, NF, FP, FN, FF. Were we to repeat the claim that these complex A-times are not held at the same time, then we would replace these nine compound A-times with another set, repeating the problems.

Sylvan (1996) thinks that Mellor's formulation is at fault. Mellor sets out *n* levels of compounded A-times, where *n* goes to infinity. Sylvan takes Mellor to argue that 'at each level contradiction arises, avoiding which forces ascent (Hegelian Style) to the next level up' (Sylvan, 1996, p. 120). The identification of a contradiction at one level forces a move to the next. However, soon a contradiction is identified in this next level which forces a move to the next level and so on viciously up the regress. Sylvan thinks that the reasoning is not vicious, nor infinite; it stops at the second level. Mellor has identified a move from (1) to (2) and 'simply assumes that what obtains at levels 1 and 2 will continue' (Sylvan, 1996, p. 120). Take the following table[56]:

Level	Tenses at that level	Number of tenses
1	P, N, F	3
2	PP, PN, PF, NP, NN, NF, FP, FN, FF	9
n	P…P, P…PN, …	2^n
.		
.		
.		
ω		2^ω

At level 1, we get Mellor's (1) ($Pe \rightarrow \sim Ne$; $Ne \rightarrow \sim Fe$; $Fe \rightarrow \sim Pe$; and so on). Sylvan reads Mellor to take (2) to be the critical step, (Pe & Ne & Fe). These two combined do yield contradictions. Mellor (1981) construes this critical step as being brought about by the inexorable change of tense. Sylvan wants to know what this logically implies. Whilst it *could* be taken to imply that all events have all three A-series positions in an ambiguous way, Sylvan thinks that what it means is that Pe at some past time, t_p, Ne at t_n, and Fe at t_f, giving us (2^t):

$$(Pe, t_p) \& (Ne, t_n), \& (Fe, t_f) \tag{2^t}$$

Sylvan claims that (2^t) shows that Mellor's move to (2) is illegitimate. Any event *e* will have all three A-positions in the sense of (2^t), but Sylvan denies that this licences '(uncontextualised) adjunction' (Sylvan, 1996, p. 121).

Sylvan thinks that tensed discourse is incomplete. 'Not everything that we might wish to say about times, especially quantificationally, can be expressed simply in tense terms' (Sylvan, 1996, p. 119). Sylvan thinks that Mellor's move to (3) is an attempt to show that tensed discourse *is* complete and remove the contradiction.

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[56] Sylvan talks in terms of tenses, addressing Mellor's 1981, but these translate quite easily into A-times.

However, Sylvan suspects that the incomplete claim when combined with (2^t) shows that Mellor's move from (1) to (2) is fallacious.

> Now (2^t) is very different from Mellor's (2), and yields no such contradictions. In terms of the derivation of (2^t), it is evident that Mellor's step to (2) is illegitimate.
>
> (Sylvan, 1996, p. 120)

If it is fallacious then simply repeating it to get from (2) to (3) cannot be allowed.

> If it wasn't fallacious, then there is no need to ascend a level or to proceed with the regress: *one* contradiction here is enough. But if it was fallacious, what is Mellor doing repeating essentially the same critical step at level 2?
>
> (Sylvan, 1996, p. 121, original emphasis)

There seems to be a misunderstanding in Sylvan's account here. First his move to (2^t) just is a differently symbolised version of Mellor's (3). Mellor too sets out (3) as the common sense attempt to show that you cannot move to (2) from (1), so for Sylvan to repeat the same move in (2^t) and claim that Mellor's move to (2) is fallacious ignores that. Second, Sylvan needs to show how (2^t) stops the regress in its tracks. The only way to do this is to invoke time, which is itself circular and fallacious. Sylvan argues that an inexorable change in tense 'means' (2^t). However, as we see he has invoked time to remove the contradiction in (1). Sylvan's move to (2^t) is itself a first step in the regress, since there must be a moment m when (2^t) holds, and m is past, present and future, so could not count as the solution. Either that or it assumes time, so is itself fallacious.

There is a sense whereby Mellor slightly misrepresents McTaggart. To explain how incompatible A-times end up conjoined Mellor claims that 'because each event is always changing its A-times, it has to have them all' (Mellor, 1998, p. 73). This is a slight misrepresentation. McTaggart does talk of an event that *is* present, *will be* past and *was* future, and this implies that A-times do change. However, McTaggart claims that this talk almost states the common-sense solution. Saying that event e is present, *will be* past and *was* future, assumes the existence of time. When Mellor claims that changes in A-time entail that e has all three incompatible A-times he assumes the existence of time to derive that entailment. It seems then we are entered into a reverse regress, in that every statement of the problem entails a statement of the solution. Every claim that event e is past, present, and future, brings out the solution that event e does not have these A-times simultaneously. The regress is not infinite because it stops at the third stage; however this 'solution' assumes the existence of time and is circular.

Mellor's development of McTaggart has given us a different take on how McTaggart's attack on the A series operates, but also helped bring out an underlying logic of the challenge faced by A-theorists. Like Dummett, Mellor ignored the 'vicious circle' argument of McTaggart's Paradox. However, as we saw, Sylvan's attack on Mellor highlights how the 'vicious circle' argument undercuts attempts to reject the 'vicious series' argument. Event e is past, present and future (step 1); Event e is not past, present and future simultaneously (step 2); (step 2) assumes the existence of time and is circular (step 3). This is the regress that needs to be resolved if we are to resurrect the A series as an account of time.

Lowe

Lowe (1998) does give us a reason to prefer the consistent to the inconsistent. However, he employs the 'vicious circle' argument of McTaggart's Paradox to derive that reason. He argues that we are not forced to say that every event E is past, present *and* future, at most we can, in the way that Prior does, say:

> For any event, e, (i) it either was, is now, or will be true to say 'e
> has happened', and (ii) it either was, is now, or will be true to say 'e
> is happening now', and (iii) it either was, is now or will be true to
> say 'e will happen'.
>
> <div align="right">(Lowe, 1998, p. 46)</div>

Lowe thinks this so much of a mouthful that we are tempted to abbreviate it in ways that can mislead. This statement merely claims that for event E, pastness can be predicated of it in one of the three tenses; at some time, t, it *will* be true to say of E that 'it *is* past'. What this does not do, Lowe argues, is deny that it was once true of a (then) present event, E, to say that 'E is happening now'. Of some past event, E, it is not *now* true to say that 'E is happening now', nor *will* it be true to say that 'E is happening now'. Since there is no implied denial of this in the rephrase above, it 'cannot be charged with harbouring a contradiction' (Lowe, 1998, p. 47).

Lowe introduces notions of simultaneity and succession to free up the A series to provide an account *of* time. He argues that it *will* be true that event 'E is happening now'. This is circular since he relies upon the existence of time to explain the use of tense. He says that in the future, it *will* be true to say that event 'E is present'. But future is a temporal concept when we are trying to develop a clear account of time. Lowe has assumed that time exists to prove that the A series is the best description of time. The A Theory should explain time, not assume time.

Lowe's account employs the 'vicious circle' argument to remove the 'vicious series' argument. As such, McTaggart's Paradox has not been removed. This criticism generalizes to most attempts to solve the paradox to date. Many A-theorists employ this strategy and similarly fail to remove the paradox. As such we see that an A-theorist may have the beginnings of a theory that is incomplete: they need to remove both versions to get started. This is not to say that it would be impossible to do. It is just that those theories to date have relied on the 'vicious circle' argument to remove McTaggart's Paradox. It is a challenge we can set the A-theorist to develop an argument for the A Theory that resolves both arguments of McTaggart's Paradox.

Baldwin (1999) employs tense logic to remove the contradictions of the A series. He then goes on to argue that even when the contradiction is removed from the A series we have reason to suppose that the B series is the true account of time. Baldwin takes McTaggart's Paradox to be set out in the following way. Taking P, N, F to be past, present (now) and future, we say of some event *e*, that P*e* and N*e* and F*e*. These are incompatible and we standardly respond that this is not the right description, rather we have PF*e* and NN*e* and *FP*e. This characterisation is consistent. The regress starts when we see that iterating tenses in this way to give McTaggart the change he requires we have to allow other iterations. Some of these combinations remain inconsistent, e.g., PP*e* and NN*e* and FF*e*. We then escape this by claiming that the true characterisation here is FPP*e* and NNN*e* and PFF*e*, and this is consistent.

The critic of McTaggart here, Baldwin thinks, assumes continued iteration makes a difference, where PF*e* does not entail F*e*. The assumption seems to be that the conception of tense employed is one of tenses being conceived as qualities of events. But Baldwin thinks '[It] is not clear how to make sense of the thought that an event's having one of these qualities [tenses] is itself an event' (Baldwin, 1999, p. 178). Were we to adopt a relational sense to tenses then the regress evaporates. 'The incompatibility of simple past, present and future tenses is an incompatibility only with respect to a single point of temporal reference' (Baldwin, 1999, p. 180). An event cannot be past *and* present relative to a single moment.

This involves a relation between the past, present and future and a *single* point in time. Baldwin adopts McTaggart's construction of a relation, where a

relationship between event X and event Y involves X possessing the quality of 'having the relation Z to Y' (McTaggart, 1908, n1, p. 461). A change in relations entails a change in the quality of the event. X changes when X's 'bearing relation Z to Y' alters to X's 'bearing relation Z to A'. Baldwin thinks that McTaggart's own concept of a relation undermines the claim that the A series is inconsistent. The X that is related to Y is different to the X that is related to A. The X related to Y possesses the property 'bearing relation Z to Y', whereas the X related to A, possesses the different property 'bearing relation Z to A'. Since X is related to different things (Y and A) X has undergone (a Cambridge) change[57]. The same thing (X) is not past *and* present *and* future. 'It appears, then, that McTaggart's famous argument for the unreality of the A-series is undermined by his own thesis that tenses are relations' (Baldwin, 1999, p. 180). Baldwin concludes that 'when the relational structure of tenses is made explicit McTaggart's 'regress' argument appears to be just a muddle' (Baldwin, 1999, p. 180).

Baldwin thinks that tensed judgements have an underlying semantics that involves token-reflexives. Tensed judgements express temporal relationships between an event and the speaker's thought about that event. A semantic account must identify the identity of the judgement itself. A change in tense, which leads to the regress of the A series, rests on the changing truth-values of token-reflexives. Take X to be the judgement 'It was raining'. We can set out the truth-conditions of X in tensed and tenseless ways. The significance of Baldwin's account of relations comes into play. Given that facts and truth-conditions both admit to tensed *and* tenseless descriptions we have no reason to prefer one series to another.

What we then require is a further reason to prefer one series to another. Baldwin looks to identity as his criterion of choice between series. If we are describing a temporal fact, Baldwin thinks that a description of a temporal fact that does not itself change ought to be taken as an indicator that the series that provides such a description is the preferred one. To do this he invokes temporal rigidity.

> [A] temporally rigid designator is a designator which
> designates the same thing at all times if it designates anything
> at all, and that a temporally non-rigid designator is one which
> designates different things at different time.
>
> (Baldwin, 1999, p. 188)

Baldwin thinks tenseless descriptions are temporally rigid, where there is no change in temporal relations. Tensed descriptions are temporally rigid *in context*, but temporally non-rigid *outside of context*. Baldwin thinks that there is a sense whereby a temporal fact is in itself tenseless. This is based on his account of relations and identity. A tensed description of an event involves a token-reflexive component and so whenever iterated counts as a description of a different event. 'It was raining' refers back to the speaker's thoughts of that event as well as the event and so really is an account of a different event. 'It rained at time T' can only ever refer to the same event.

This is a standard B-theorist reaction to the A series, and we will look at this further in Chapter 6. It was necessary to go through Baldwin's argument a little because had we left this account at his removal of the contradiction inherent to the A series he would have been threatened by the 'vicious circle' argument of McTaggart's Paradox. He claims that McTaggart's Paradox is removed once the relational nature of tenses is taken into account. These show that an event that *is*

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[57] Cambridge change occurs when a person/object changes because of a physical change in something else. For example the first child changes from being an only child to an elder child when his/her sibling is born. The child has not gone through any change like change of height etc., but has changed because of some change in the world around them.

present, *was* future and *will be* past will not start a vicious regress because it is a tensed description, supervenient upon a tenseless description of that event being simultaneous to my thought of that event, and the future of that event being earlier than this present thought and the past of that event being later than my present thought. When the event changes to *is* past, *was* present and future, my tensed description of that event is the description of a *different* event. This assumes the existence of time to remove the contradiction, but that time is B-time.

I will leave Baldwin here, his account is one in a long tradition of attempting to neuter McTaggart's attack on the A series. These are based on an analysis of the series itself. I will turn briefly to Fine (2005) who attempts to resolve McTaggart's Paradox in quite a novel way. Most attempts to disarm McTaggart's attack on the A series have focused on separating the predicates past, present and future in some way. Fine follows this tradition but with a slightly different slant. Others attempt to do this by separating the predicates within the universe. Fine fragments the universe, so that the some present event E is past in the same universe, but that universe is fragmented, so the part of the universe where E is present cannot be connected to the universe where E is past (and future). Thus it is not possible for event E to be past *and* present *and* future in a way that would bring about McTaggart's concerns. Baldwin claimed that inconsistency needed to be explained in terms of consistency. Fine rejects this move and suggests that the universe may be '*irredeemably incoherent*' (Fine, 2005, p. 281, original emphasis).

Fine sets up McTaggart's Paradox in quite a novel way, but I will delay setting this out until Section 8 below[58]. What we want is an account that is neutral about times, i.e. does not privilege one time over another. A time T is privileged if the facts that constitute reality are oriented towards time T and no other. Our account also needs to apply to reality in an absolute way, and not be applied to reality in a relative way, say relative to some privileged time T. Fine thinks we naturally expect an account of reality to be consistent, where all contradictions get ironed out. A poker cannot be hot *and* cold, but it can be hot-at-T and cold-at-T^{+1}. Fine suggests we adopt fragmentalism, which rejects the fundamental assumption that we can make the poker being hot compatible with the poker being cold. 'It is taken to lie in the character of reality that certain apparently contradictory aspects of it cannot be explained away' (Fine, 2005, pp. 280- 281).

Reality is fragmentary, and some facts that constitute that reality will cohere and some will not. Because reality is fragmented, no part of that reality can be regarded as 'belonging to a single coherent whole' (Fine, 2005, p. 262). Each fragment is part of a 'single though incoherent uber-reality' (Fine, 2005, p. 306). The fragmentalist can claim that inconsistent facts exist but deny that there actually are contradictions.

> Although there is a sense in which the fragmentalist takes reality to be contradictory, her position should not be seen as an invitation to accept contradictions. Even if reality contains both the fact that I am sitting and the fact that I am standing, it will not be correct for me simultaneously to assert both that I am sitting and that I am standing.
>
> (Fine, 2005, p. 282)

This is similar in many ways to the treatment of inconsistency in general, which I turn to in Chapter 18. It is sufficient for present purposes to show that Fine disarms McTaggart by fragmenting the universe, rather than separating the predicates past, present and future within the universe.

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[58] See p. 45

This has quite a challenging metaphysic and we might baulk at solving McTaggart's Paradox in such a way. We *could* resurrect the A series but the metaphysics becomes quite complex. Fine's fragmentalism is quite similar to a modal reading of McTaggart, and I turn in the next section to look at just such an approach. I have included Fine's work as an approach available, but one with a significant cost. We might think the same of a modal approach.

6. *A Modal Alternative*

Bigelow (1991) develops a modal analysis that he hopes will escape McTaggart's Paradox. Only present things exist, *in the actual world*. When we refer to a future thing, whether an event or object, we are saying that this *future* thing is present in some other *possible* world. Each thing when it exists is present. However its status as past, present or future is determined by which possible world *we* are actually in.

> [We] could posit that past things, as well as future ones, do not exist at all in the actual world. All that actually exists is the present. Things have the property of being past, not by existing in the actual world and having the property of pastness, but by existing in some other possible world which is "in the actual world's past".

> (Bigelow, 1991, p. 16)

If the only thing that is real is the present then we could avoid McTaggart's Paradox, since E could not be past and present, it could only be present. Bigelow supposes that only present things exist, but combined with a carefully set out "temporal" accessibility relation between worlds we can develop an internally consistent theory based on the A series. Bigelow invokes possible worlds to explain why a thing present in the actual world is not also past and future. It is present in the actual world, but it *could* have been past, and *could* have been future. The 'could' here does not entail 'is', so McTaggart's Paradox does not apply. Something past in one world does not possess any special property; it does not exist *in* that world. However, it does exist in some possible world in the actual world's past. That possible world is related to the actual world in a distinctive way. This accessibility relation can be 'recast under the hypothesis that only things present actually exist' (Bigelow, 1991, p. 17)

Oaklander (1994) thinks that possible world interpretations face a dilemma. First, if the conception of modality here is modal possibilism, then there is no room for change, for the central event never changes its temporal properties; if it is present in the actual world then it can only be possibly future/past. These other temporal properties, being only possibilities *remain* only possible, so our central event stays present.

But if the modality is actualism, then Oaklander believes that the contradiction follows. What is present in world ω is past in world v and future in world x: making that thing past *and* present *and* future. If so, then whilst McTaggart's Paradox does not apply within a world, it does apply *between* worlds. Event E is present in ω which is present, present in v, which is past, and present in x, which is future. However, E still comes out as past, present *and* future once this is made explicit. Whilst E is always present, the past, present and future worlds seem just to move the contradiction up a level; E is present past, is present present, is present past. As Dummett (1960) might comment, some of these descriptions are inconsistent.

There is a sense whereby Oaklander's criticism doesn't apply, since it is not necessary that it is the *same* thing that is past, present and future. Rather, a present

thing in world *ω* has past counterparts in world *v* and future counterparts in world *x*. Since we are talking about different things, the contradiction does not follow. Since they are different things, the *same* thing is only ever present, not past present and future.

This move however collapses into the first horn of Oaklander's dilemma; it no longer gives an account of dynamism, so we might suspect that it is an account based on the B series, not the A series. A thing in world *ω* is present, but past in world *v* and future in world *x*. The thing in world *ω* does not change its temporal properties, remaining always present, nor do the thing's counterparts change their properties; a thing that is past in world *v* will remain past and a thing future in world *x* will remain future. Here, once a thing is in that time series it forever stays at that position, and this sounds like McTaggart's claims about the B series.

If so, then a possible world analysis cannot resolve McTaggart's Paradox without rejecting the A series since, even in Bigelow's modal case, there would be no change. Modal realism and possibilism cannot account for the passage of time, something Bigelow is keen to explicate as the following passage shows.

> The existence of such worlds is essential for time to be something which passes, so if the modal theory is to work at all, we must assume that there are at least these worlds.
>
> (Bigelow, 1991, p. 13)

However, as we have seen, modal theory cannot account for the passage that Bigelow requires.

7.   *A Complete Description of the Universe*

McTaggart thought that only a tensed description of the universe could give us a complete description of that universe. Suppose instead that a tenseless description of the universe were sufficient for a complete description of the universe. If so, then merely indexing events and things to time would capture the universe, including time. Or so we might thing. Geach thinks that the strength of McTaggart's argument is in the claim that we are strongly biased to think that there is a neutral view of the universe, which is observer independent. If such a bias is true then the A characteristics cannot be real, possibly because, I think, every event is seen as *now*, and nothing gets seen as past or future. Without such a series, Geach thinks McTaggart's conclusions about time follow: for there would be no change. Geach draws these conclusions from Dummett (1960), who argued that 'McTaggart is taking it for granted that reality must be something of which there exists in principle a complete description' (Dummett, 1960, p. 356). Dummett, however, thinks that a complete description of temporal reality is not possible without the use of token-reflexive expressions. Yet the tenseless claims I made above implies that such a complete description is possible. I think such a description is possible, but McTaggart, as brought out by Dummett thinks it impossible.

Dummett believes that the first step in McTaggart's thesis shows that whilst it is possible to render a complete description of space without the use of token-reflexive expressions (or we might add, indexicals), it is not possible to do so for time. Were a person to live throughout time, observing each moment successively, even though he knows about every time, he *could* not describe that time completely without employing token-reflexive expressions. He could not, for example, say what events are happening *now*. Nagel (1986) puts it this way; we can describe a temporal order of events from no point of view in time, what we cannot do is describe their pastness, presentness or futurity. Yet we cannot seem to do without knowing the fact that it is *now* a particular time. 'The tenseless description of the temporal order is essentially incomplete, for it leaves out the passage of time' (Nagel, 1986, p. 57, n.1).

Alternatively, were a person able to survey the whole of time, she would observe a four-dimensional block model. This may capture the four-dimensional representation of what occurs. She cannot, however, observe our movement, notably the movement of our consciousness; 'like someone observing the road but blind to the traveller' (Dummett, 1960, p. 355). If she does see the movement then the only way to describe that would be through the use of token-reflexives.

Under Dummett's description, McTaggart seems to claim that were time real, there could be no complete description of it without the employment of token-reflexives. Since no such complete description of time is possible, there could be no complete description of reality, if time were real.

Dummett is inclined to think that if there must, in principle, be a complete description of any mind-independent phenomenon it follows that time cannot be real. Start with the thought that the claim that time is unreal seems self-refuting. To see how this works, Dummett follows McTaggart in claiming that we seem to interpret a non-temporal series as a temporal series. If so, then which interpretation do we adopt? Interpretations change and it seems to follow that 'even if the world is really static, our apprehension of it changes' (Dummett, 1960, p. 356). So the belief that time is unreal seems self-refuting because it involves choosing one interpretation amongst many, i.e. an interpretation at time T; to show that time is unreal we have to be *in* time. Dummett thinks that time is A-time and accepts McTaggart's arguments against the A series. If so, then it follows, Dummett thinks, that we ought to follow McTaggart in 'abandoning our prejudice that there must be a complete description of reality' (Dummett, 1960, p. 357).

I am not convinced that we do require token-reflexives for a complete description of reality. There could be two ways we could take a complete description to work; first that a non-indexical account of temporal reality does leave something out, but we can reinstate a complete description without indexicals; or second, a non-indexical account does not leave anything out. I will focus on the first way of taking a complete description. On Dummett's first case, we could answer the question 'what events are happening *now*' in the following way. Time T is present so all events simultaneous to time T are occurring at time T. Such a response does not include a token-reflexive, even though the 'are' is tensed. It may not account for our experience of time T, but that was not the question. If we were forced to include a description of out experience of the *now* we could say that at time T, events X, Y, C, were occurring and these formed part of the experience of person A; again, no use of token-reflexives. On the second case, where we adopt a God's eye view of the four-dimensional block, we could adopt a similar approach. The claim is that such a picture could not capture our movement through the block. But saying that X is at Y at T before X is at Z at T^{+1} does seem to give an account of movement. Between T and T^{+1} X has moved from Y to Z. This may not capture that movement, but what do we mean by 'capture'? The claim is that we would not *see* the movement. This may be true, but it does not follow that such a picture could not include accounts of movement.

Dummett compares temporal descriptions with spatial descriptions. A description of space does not require the use of a spatial 'here', though we employ one for practical purposes. The removal of temporal indexicals such as 'now' however does not seem merely practical. Rather it appears essential to a complete description. This may, however, be a result of intuition alone. That we feel temporal indexicals essential for a complete description of the universe does not entail that a complete description of that universe has to describe tenses.

A distinction would prove useful here. I suggest that we need to distinguish between an indexical temporal description and a description of temporal indexicals.

A description of temporal reality could be indexical, invoking 'now' to identify a particular point. It does not follow that that point *is* now. However, if time were tensed, and there were a *'now'*, then we would require indexicals for a complete description. Since if we did not describe temporal indexicals our description would be incomplete. Dummett's claim is ambiguous about this.

If the temporal indexicals were merely a feature of our *description* of the universe then we could quite easily, though admittedly uncomfortably, remove those indexicals and replaced them in the ways indicated above. That we feel more comfortable using temporal indexicals to describe temporal reality is no reason to suppose that they are *necessary* for our description. They would only be necessary if time itself was tensed, i.e., involved temporal indexicals with their own ontological status. We would require a past, present and future.

This distinction also helps deal with the second characterisation of a complete description. If the universe were tensed then a complete description would require indexicals. If the universe were tenseless then a complete description could be made without indexicals. What we would require to decide the issue here is science. As we will see in Chapter 4, science does not describe a tensed reality. Taking our lead from science we ought to conclude that a non-indexical description of temporal reality is sufficient.

To 'describe' is to give an account of everything real, suppose. The above description gives an account of all that is real, without the use of token-reflexives. A description that, Dummett interprets McTaggart as saying, must include token-reflexives. The conclusion seems to be that we could not describe time without the inclusion of the past, present and future and to do this we require temporal token-reflexives. However, distinguishing between an indexical description and a description of indexicals nullifies such a move. I suggest that until we have reason to believe time is A-time, then static descriptions of reality ought to be taken as complete descriptions, and that the apparent need for indexicals resides purely within our experience.

8.   *Reality*

All this talk of reality begs the question what we actually *mean* by reality. This is a fault in the debate that Fine (2005) attempts to redress. Fine thinks that we must first make explicit use of the concept of reality. Fine thinks McTaggart's argument 'has a great deal of cogency' (Fine, 2005, p. 270), and tries to explicate it in terms quite distinct from those covered above. Looking at Fine will build upon the distinction made above. I talked of an indexical description and a description of indexicals. Fine distinguishes between mere reality and reality. This distinction mirrors my own.

Fine thinks three key distinctions are required; we need to distinguish between;

1) How things are, or mere reality, and how things are in reality, or metaphysical reality.
2) How things are in reality *simpliciter*, or absolute reality, and how things are in reality from a particular perspective, or relative reality.
3) Reality being dense, or 'of a piece', and reality being discrete, or fragmented.

Each of these concepts will give different accounts of reality. I take the implication to be that until one version is adopted, members of the debate might be talking passed each other.

I will focus on the first here, since this will help explicate McTaggart's argument in terms of a concept of reality. Fine thinks that we can distinguish

between how things are, or mere reality, and how things really are, or metaphysical reality. Whatever really is the case can be taking to be how things are. The reverse does not follow. Fine here wants to get to grips with the distinction between something that is a property of reality itself, and something that is a property of our description of reality. Mere reality is a description, or representation, where that description fails in some way to apply to metaphysical reality. Metaphysical reality is whatever exists independently of how it is, or whether it is, represented.

> I might accept that I am sitting, and even accept that it is a
> fact that I am sitting, for example, but not accept that this fact
> is constitutive of how things really are[59].

<div align="right">(Fine, 2005, p. 267)</div>

When reality gets represented, there may be features of that representation that does not fully reflect reality. The representation may show that the world is one way, when it really is not. There is an asymmetry here, whereby what belongs to metaphysical reality can plausibly be taken to belong to mere reality. What belongs to mere reality will not, in general, hold.

By 'reality' Fine means the ontology represented by facts. He adopts a 'container' model of reality, (Fine 2005, p. 268). To say that 'I am sitting' under this interpretation comes out as 'reality contains – or is constituted by or is composed of – the facts that I am sitting' (Fine, 2005, p. 268). Fine does not actually give an account of 'reality'. He thinks that such an account may not be possible, except in general terms[60]. Rather, reality is understood though its application. Reality is applied to tensed language, for example, to see whether tenses are part of our language alone, or part of 'reality'. Fine sees no additional role for 'reality' in his account. Reality as an entity in itself does not need to be developed beyond the container model[61].

Fine thinks that the question is whether tensed facts are constitutive of reality: 'whether for any tensed (or aspectual) statement S it is constitutive of reality that S' (Fine, 2005, p. 268). Is statement S constitutive of metaphysical reality or mere reality? If statement S picks out a fact that belongs to metaphysical reality then it can plausibly be taken to belong to mere reality. If statement S picks out a fact that belongs to mere reality we need not accept that this picks out a fact that belongs to metaphysical reality. Solutions to questions about tense (and anything else) get decided by invoking a concept of reality.

Since reality plays no part in McTaggart's argument, Fine reconstitutes it to make the concept of reality more explicit. Fine's move would also give us ways to get to grips with McTaggart's argument without assuming it is an argument merely about tense. Fine identifies four assumptions behind McTaggart's argument.

1. *Realism*; Reality is constituted (at least, partly) by tensed facts.
2. *Neutrality*; No time T is privileged, the tensed facts that constitute reality do not exclusively pick out one time as opposed to another.
3. *Absolutism*; Reality is absolute, not constituted be facts relative to some temporal standpoint.
4. *Coherence*; Reality is not contradictory, not constituted by facts that are mutually inconsistent.

In this form, which Fine calls simplified, he sets out 'constitution' to mean being a basic notion. To understand what we mean by reality being 'constituted' by tensed or tenseless facts, we take constitution to mean not understood by any more basic

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[59] Fine uses constitutive here to mean that reality contains whatever it is said to constitute it. For example, if reality is constituted by tenses, then reality contains tensed facts.
[60] Fine, 2005, p. 267.
[61] Fine, 2005, p. 268.

conception. If our constitution of reality is X, X cannot be understood by any other, more basic concept Y; X is the basic notion and constitutes reality.

Fine explicates McTaggart's argument in the following way:

1a. *Realism* entails that reality is constituted by some tensed fact, which obtains at time T.

2a. *Neutrality* entails that reality is not oriented to one particular time T; and facts that obtain at T *might* be inconsistent with facts that obtain at T^n.

3a. *Absolutism* entails that reality is not constituted by facts relative to some temporal standpoint, T.

4a. *Coherence* is barred by 2a and 3a.

To see how this applies to McTaggart's theory we can look at it as follows. For time to be considered real, we need tensed facts. Tensed facts obtain at a privileged moment in time (1a). This parallels McTaggart's claim that for time to exist we need the A series. Fine moves to the claim that reality does not, in fact, privilege one moment over another (2a). Each time T^n is equally real. However, a poker that is hot at time T and cold at time T^{+1} involves an object possessing incompatible properties. This mirrors McTaggart's theory which is sometimes characterised as a mixed theory. McTaggart believes that both the A and the B series are elements of time. Fine's absolutism builds on this by setting out the claim that not only is no moment privileged over any other moment, neither are facts or truths relative to any particular time T^n (3a). Last, if time is to be real it must, following McTaggart, be consistent. However this consistency is barred by a tension between (2a) and (3a). (2a) states that there may be facts that are relative to a specific time, T. (3a) denies this (4a). If metaphysical reality is tensed, and no time T is privileged over others then it is possible that two incompatible tensed facts obtain of that reality, which entails that reality is inconsistent.

Fine here sets out the assumptions he identified as underlying McTaggart's argument to show how, when combined, they lead to inconsistency. McTaggart held that inconsistency is a sign of non-existence.

We *could* reject the claim that 'constitution' involved *basic* concepts; rather we *could* invoke many different concepts to describe reality. If so, then we might escape the conclusion that 2a., combined with 3a., leads to incoherence. Fine develops a more sophisticated characterisation of McTaggart's argument focusing on explanatory power, to allow for many different approaches. To do this he replaces 'constitution' with 'composition'.

1. *Realism*; Reality is composed by tensed facts.

2. *Neutrality*; No time T is privileged, the tensed facts that compose reality do not pick out one time as opposed to another.

3. *Absolutism*; Reality is absolute, not composed of facts relative to some temporal standpoint.

4. *Coherence*; Reality is not contradictory, not composed by facts that are mutually inconsistent.

Fine sets out two further requirements. First he sets out a 'no collapse' stipulation that the realist cannot attempt to meet assumptions 1 – 4, by collapsing into anti-realism. Second, he claims that inconsistency needs to be explained in consistent ways. Start with the claim that were reality composed of different facts at different times then we need to explain the possibility of this in terms of an absolute composition of reality. If these facts are incompatible, Fine thinks that the realist needs to explain the inconsistency in terms of consistency.

> [He] must explain how [incoherence] is possible in terms of a
> coherent notion of composition, one that does not allow for

incompatible facts. The apparent incompatibility must
disappear on a deeper view of how reality is composed.

<div align="right">(Fine, 2005, p. 273)</div>

This requirement however, seems to revert to Fine's simplified version. He develops a sophisticated account to generalise his account to those who may wish to avoid calls to basic notions in their theories about reality. However to assess whether such theories are viable we still require such basic notions.

Setting such concerns aside, we see that Fine's point here is that the four assumptions from McTaggart's argument cannot be met by the realist in his argument for the reality of tense (or any other notion). Start with the claim that the argument, to be neutral must be explicated in terms of relativism or incoherence. Fine develops a McTaggart-like regress based on the assumption that the argument is relative (it works in similar ways to being incoherent). If we argue for relativism then our appeal must be made to an absolute notion of composition, which must conform to the realism assumption (or it collapses into anti-realism contrary to the no-collapse requirement) and also to neutrality. It follows that the argument is not coherent. This inconsistency needs to be explained in terms of coherence, which should conform to realism, in violation of absolutism. The argument continues ad infinitum. The supposed explanation of neutrality in terms of relativism or incoherence results in an infinite regress.

Fine's characterisation also helps get a grip on the circularity involved.

No purported explanation of relativity or coherence can succeed since, in any such explanation, we will ultimately have to appeal to the very feature that we are trying to explain away.

<div align="right">(Fine, 2005, p. 274)</div>

If so, then neither absolutism nor coherence can be made compatible with neutrality and realism.

Fine's reconstitution of McTaggart's argument generalises the form such that it need not solely apply to tense. It does this by making explicit use of facts and reality. Fine then develops a response to the argument by looking at the second two distinctions (between absolute reality, and relative reality; and between reality as or fragmented). I will not develop these as I intended here to set out Fine's account of McTaggart's argument, rather than his solution to it. It is enough to understand Fine's account as this has helped us develop deeper insights into how McTaggart's argument works.

9.   *Conclusion*

Here I looked at several issues pertinent to McTaggart, in an attempt to develop a deeper understanding of his framework. To do this I have looked at many of the responses to McTaggart's argument in some detail. This has taken some time but I think it a worthwhile exercise because it has allowed us a deeper insight into the reasoning within McTaggart's theory.

What I have hoped to achieve here is to demonstrate that there is an ongoing discussion not only about the issues raised by McTaggart, but also about McTaggart's method in raising them in the first place. Many of the criticisms laid at McTaggart's feet have rested on some confusion about his actual argument and errors in representation of that argument. I think this understandable as his argument is both complex and in places a little ambiguous. I think I have got him right though and feel that the above analysis has brought out this interpretation.

I think Mellor's account of McTaggart a good one, generally worth consideration. Fine's account is an innovative interpretation which I think shows

that attempts to adopt realism about the A series, or tensed time in general, involves the adoption of a radical metaphysic, such as relativism, or Fine's fragmentalism.

As such, I think that McTaggart stands as one half of the major obstacle in any account that attempts to build an ontology on the A series. The second half of that obstacle is Einstein's Special Theory of Relativity (SR), which I will touch upon in the next chapter. B-theorists may think that the success of McTaggart's attack on the A series entails a B-ish ontology, but this too ignores some of McTaggart's argument. The B series cannot, if McTaggart is correct, account for time. I think McTaggart's argument weak here, as I suggested above. However, I believe that SR shows that McTaggart may have been correct in his assessment. I will turn to this too in the chapters to follow.

In the chapters that follow I turn to look at the two traditional attempts to refute McTaggart: by A-theorists who reject his claim that the A series is contradictory, and by B-theorists who reject his claim that the B series alone cannot account for time. Both attempts will be seen to fail: The A Theory fails, largely for the reasons McTaggart identified. The A Theory has yet to rid itself of McTaggart's Paradox. It will also be seen to fail because of some of the lessons we can develop out of SR.

The B Theory fails because it begs certain questions. On the other hand, the failure here is a minor one: the B Theory assumes a natural direction for time, but this direction needs an argument. One is available so the charge here is not as fatal as my charge against the A Theory. The B Theory has an explanation for our experience of time, but I will argue that a third approach is superior since it makes fewer assumptions about time itself; the C+A Theory of Time.

I will argue that the solution to time lies in a systematic development of the explanation for why we mistake the C series for the A and B series. Looking at McTaggart has given us a background against which we can develop an explanation for why our experience of time is so unlike our understanding of time. In the next chapter I will show how the A Theory fails. But the A Theory does not fail because it does not describe our experience: the A Theory is the best description of our experience. The A Theory fails because it cannot explain our understanding of time.

Chapter 4
The A Theory of Time

1.   *Introduction*

Chapter 2 set out McTaggart's theory both as a conceptual scheme for my thesis but also to develop a problem for anyone wishing to base their theory on the A series. The A-theorist will need to show that his theory can solve McTaggart's Paradox. Here I set out a second problem: Einstein's Special Theory of Relativity (henceforth SR). If an A Theory is to work it should first be consistent, or at least explain the inconsistency involved in the A series; second, it needs to give an account of the ontology of the universe that is at least compatible with SR. I will not set out an exhaustive account of A Theories here, but rather a representative sample of those developed to show that they either fail to satisfactorily resolve McTaggart's Paradox, conflict with science, or both. I will assume in a debate about ontology, science should not be rejected by philosophy here

These two challenges, if left unmet suggest that an A Theory has significant problems if it purports to represent our understanding of time. A-theorists believe that time is A-time, so we *can* reconcile our experience of time with our understanding of time: our understanding of time reflects our experience of time. If this *is* our understanding of time, as the A-theorist claims, then to reflect time itself we need the A series.

2.   *The Special Theory of Relativity*

Einstein's Special Theory of Relativity (SR) has come to be seen as a significant hurdle for those who wish to base a theory of time on the A series. SR is based on two claims; first, there are inertial coordinate systems, or frames of reference, which provide a complete description of physical reality; second, the laws of electromagnetism as exemplified by the constancy of the speed of light, are invariant across any complete description, i.e. these laws remain invariant when we change from one frame of reference to another. In other words, every legitimate frame of reference can act as a base for accurate descriptions of the universe, and the speed of light is constant across these frames[62]. It is the combination of these two claims that lead to problems for any A Theory. I do not wish here to set out Einstein's theory in depth but will look at two areas that have the most significance for time. The first is one of the main reasons why SR is seen as such a problem for A-theorists: the relativity of simultaneity. The second has ramifications that undermine some claims made by A-theorists: the light cone.

The Relativity of Simultaneity

Consider a train travelling Eastward along its track and two lightning strikes, one at the front (E_1) and rear (E_2) of the train[63]. These lightning strikes leave a mark at both ends of the train and on the track. Take m_1 to be the mark on the track made by the lightning striking at the front of the train and m_2 the mark on the track left by the lightning strike at the rear.

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[62] Within SR, a frame of reference is a coordinate system relative to which Newton's first law of motion is true, where *"Every body perseveres in its state of being at rest or of moving uniformly straight forward, except insofar as it is compelled to change its state by forces impressed."* (Newton, 1687, p. 416, Translator's italics) The general form of the laws of nature remain constant whenever we change a frame of reference. The constancy of the speed of light is invariant across any change in frames of reference. It will record the same whatever the state of motion of its source or of the device used to record it. Frames of reference are tools of description.
[63] This is a thought experiment employed by Einstein, 1905, to develop relativity of simultaneity.

Take two recording devices, A and B; device A is beside the track, whilst device B is in the centre of the train. In A's frame of reference, A records as being exactly at an equal distance between m_1 and m_2 and to be at rest relative to them. Device B is in the centre of the train and at rest relative to it, such that B measures itself as equidistant from the marks left by the lightning strikes on the train.
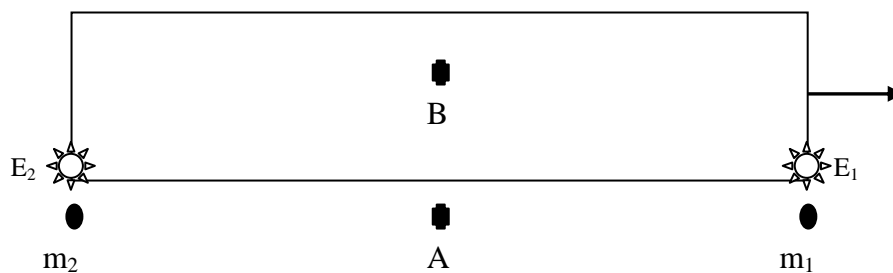

Figure 1

In A's frame of reference, B is travelling in uniform motion in an Easterly direction from m_2 towards m_1. In B's frame of reference, A is travelling in a Westerly direction. The frames of reference of A and B are good frames, because in them Newton's first law of motion is true.

Adopting A's frame of reference, the light signals travelling at a constant speed (c) from E_1 (m_1) and E_2 (m_2) are recorded as arriving simultaneously. A is at rest relative to the marks m_1 and m_2, and placed at an equal distance between them. The light signals from the lightning strikes have the same distance to cover, which is why A considers events E_1 and E_2 to be simultaneous.

In B's frame of reference, B is in the mid-point between E_1 and E_2 and we conclude that for B, E_1 occurs before E_2. How so? Even though B is at the centre of the train and at an equal distance from the marks left by the lightning strikes on the train, the light signal travelling from E_1 arrives slightly before the light signal travelling from E_2. In the short time that it has taken the light signals to travel from E_1 and E_2, B has moved towards m_1, the mark left by the lightning strike, E_1, on the track. The light signal from E_1 has less distance to travel than the light signal travelling from E_2 and so arrives at B first. Therefore, in B's frame of reference, event E_1 occurs before event E_2. Both A and B are correct, for their frames of reference are good.

This shows that simultaneity is relative, *not* absolute. The temporal order of the two events, E_1 and E_2, are relative to a frame of reference. If time were absolute we would say that two events that occur at the same time according to one frame of reference, would occur at the same time in all frames of reference. We would have a criterion with which to choose whether Observer A or Observer B represents the true temporal order of events E_1 and E_2. But each frame of reference is good and the events recorded in them are valid. We cannot adopt one frame of reference as *the one* true representation. Simultaneity is relative to frames and is not an objective feature of the universe. This conclusion has come to be seen as a major barrier for any who wish to develop a theory based on the A series of time.

The Light Cone

Now to look at one of the ramifications of SR, to show that there can be structural problems for the A-theorist. It is not just that simultaneity has to be relative to a frame, SR also shows that the structure of the universe is symmetrical; thus we could not break the universe into asymmetrical parts such as the past, present and future. The light cone is a structure formed around an event by the trajectories of light. Consider an event E. We can map all the trajectories of light that arrive at E,

and all the trajectories of light that depart from E. These form the surface of a three dimensional structure, the light cone (See Figure 2)

Future Light-cone

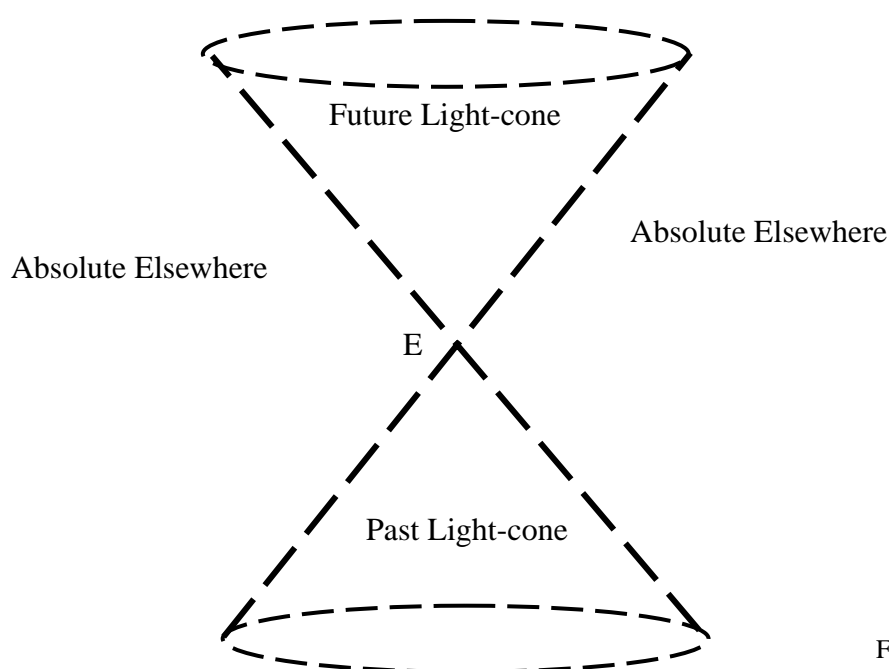Absolute Elsewhere

Absolute Elsewhere

E

Past Light-cone

Figure 2

There are three areas of the light cone: the absolute future of E, the absolute past of E and the absolute elsewhere of E. All points on the surface of the cone can be connected to E by light travelling in a vacuum, and are said to be 'light-like' related to E. All those points in the regions absolute future and absolute past can be connected to E by signals travelling slower than light and are said to be time-like related to E. All those points in the absolute elsewhere of E could only be connected to E by signals travelling faster than the speed of light and are said to be space-like related to E. The distinctions 'absolute future' and 'absolute past' are ones of convention, which disavows any attempt to derive a direction of time from the light cone structure. We can quite legitimately swap these two areas. In other words, space-time is symmetrical; since there is no direction, no preferred regions, we could not identify the past, present or future.

The light cone shows that the apparent direction of time is merely a matter of convention. We choose which section of the light cone to call future/later or past/earlier. Nerlich (1982) argues that the light cone is the basic structure of space-time. If the light-cone shows that directional choice is arbitrary, and reflects a matter of convention then SR shows that time is isotropic, for in each direction it has the same physical presence.

These are the two areas of SR of most significance for time. There are other areas, but I will just use these two to show that SR poses problems for the A-theorist. Briefly, SR shows that there is no universe-wide moment of simultaneity. Naively, we might think that such a moment was required to distinguish the past from the future. The structure of space-time is symmetrical, which shows that even were we able to overcome the relativity of simultaneity, the direction implied by the A series has no ontological grounding in the universe. So were we to claim that there is a past, present and future we would be contradicting SR, or at the very least the burden of proof would be on us to show that SR is at fault. These are claims I will develop further when looking at A Theories. I set them out briefly to show that SR is a significant hurdle for anyone who wishes to base an ontology on the A series. When

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we combine SR with McTaggart's Paradox, we see that there are two formidable hurdles for the A-theorist. I do not believe that these have been overcome.

Strategies Against the Argument from SR

The argument from SR could be defended in a number of ways.
1. Reject SR
2. Defang SR
3. Use GR to overcome SR

At first Tooley (1997) seems to adopt the second strategy but he argues in ways which seem to reject SR. Craig (2000b) thinks we can take the bite out of the argument from SR by adopting a functionalist approach. Swinburne (1968) thinks that GR can overcome SR. I think these attempts contentious and will prefer that we retain SR, on grounds that contentious claims give little reason to overturn proven science. Furthermore, there is a tendency to prefer philosophy over science and this is a questionable move. In questions about ontology, I will favour science over philosophy.

Tooley (1997) makes two claims about SR that combined entail the rejection of SR. First we could develop an absolute concept of a frame of reference, second, that the speed of light could vary between frames of reference. First, Tooley thinks that if we are substantivists about space-time we can find a frame of reference, which is in some sense at absolute rest. Once we find this frame of reference we can then build dynamism into the world through the propagation of light from that one frame. Each space-time point also plays a causal role; each point causes at least another to exist, and was itself caused by another. Causally related points are considered to be on the same line through space-time. We can then build a notion of absolute simultaneity into SR; two events are absolutely simultaneous if they are simultaneous relative to our one absolutely inertial frame of reference.

Second, Tooley thinks that the speed of light *does* vary. If light travels at a constant speed (through substantive) space, then a frame considered at uniform motion relative to absolute space should record light travelling faster than other, stationary frames. To overcome the implied conflict with SR here, Tooley thinks it necessary to eliminate an assumption in the standard formulation of SR; that light travels at a uniform motion in all directions in space-time[64]. Tooley rejects the claim that *one-way* light travels at the same speed. Einstein's claim that it did was based on the evidence that *return*, or *two-way* light travels at the same speed. That light travels one way at the same speed was an assumption on Einstein's part, one Einstein made a matter of convention. Tooley rejects that assumption. He thinks that it is not true that light travels at the same speed in all frames; it travels slower in frames at absolute rest. To explain why we do not detect such variation, Tooley develops a 'Lorentz-style compensatory theory' (Dainton, 2001, p. 279). Light travelling in moving frames is systematically affected by those frames in such a way to conceal this discrepancy in speed. We could claim that this theory invokes a real relationship that we have no reason to suppose exists: *absolute simultaneity*. Tooley thinks that we can invoke Quantum Mechanics as a motivator to show that some reasons for this adaptation of SR exist; the problems of non-locality. Two particles, where one is measured the other not take on specific measurements as a result of the one measurement. This is thought to show either that backward causation is possible, or that signals travel faster than the speed of light. Tooley prefers the faster than light hypothesis; some things occur absolutely simultaneously. Tooley does not stay within SR to reconstruct simultaneity, but relies upon QM, and as Dainton (2001)

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[64] Tooley, 1997, p. 346.

notes, results from QM are contentious. As such I set aside Tooley's claims as contentious, though interesting[65].

The second strategy involves removing the teeth of SR, to show that an A Theory could be consistent with it. Craig (2000b) believes that SR is really a theory about measurement, especially in the Einsteinian version I have employed here. As such, we can allow for relativistic measurement whilst retaining absolute notions of simultaneity.

Craig follows Newton in asserting the existence of a metaphysical (absolute) space-time which is left unaffected by relative space-time and its measurements. Craig focuses on the verificationist interpretation of Einstein, who Craig thinks was overly influenced by Mach and Poincaré. As such, Einstein focused too much on drawing conclusions from mere measurements. Craig thinks that because of the rejection of positivism, SR's use of positivism to undermine absolute simultaneity should also get abandoned Craig believes that it was positivism, not scientific discoveries, that drove the development of the relativity of simultaneity. Once we take away that motivation the conclusion falls.

Craig thinks that once we reject positivism we can reject the relativity of simultaneity. If SR, as a theory, is only a theory of measurement then we can invoke an absolute metaphysics to underlie it. This underlying metaphysic is absolute and can give us a universe-wide moment of simultaneity. Craig (2001a) follows Arzelies, who argued that space-time (especially in its diagrammatic form) is a useful tool but no more; it does not depict reality[66].

> We both can and should distinguish between metaphysical
> time and physical time and maintain that the former is
> characterized by a universal and objective present and, hence,
> relations of absolute simultaneity.
>
> (Craig, 2001a, pp. 167 – 168)

Craig thinks that once we acknowledge the positivistic history of SR, and the arbitrary re-definitions of temporal concepts we see that there is nothing in SR that shows the absolute present does not exist.

But there is only one reason to believe that any measurement is functional, if SR is to be reduced to a functional theory, and that is to show that the measurement is accurate. Thus, if SR is to be an accurate measure, it must, I believe, invoke an ontology. If SR is only a function of measurement then how are we to account for the relativity of simultaneity? Given an absolute metaphysics then we should be able to identify all events simultaneous to event E at time T. SR fails to do this, and so fails to be an accurate tool for measurement. Craig is not removing the teeth of SR, he is rejecting it.

If Craig were right then we could not rely on SR for an accurate picture of reality, because it does not involve absolute relativity. Whilst Minkowski space-time *could* be seen as the absolute metaphysical space-time required for Craig's interpretation, it involves variation in space *and* in time, though not in space-time. As such, there would still be relative simultaneity since this is temporal.

Craig thinks this a result of the focus on measurement, yet I believe that science should be our guide to what is real. If science is to help us understand the universe we ought to assume that it at least attempts to be accurate about the universe, and not develop accurate functions. On this assumption I think Craig is wrong to reject SR as merely a theory about measurement. That measurement only makes sense if it is accurate.

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[65] For a clear discussion of these issues, see Dainton, 2001, chapter 1, pp. 269 – 283.
[66] Craig, 2001a, p. 78.

Moreover, to reject measurement merely because positivism (as a philosophy) is rejected seems to go the wrong way. As I stated above, in a debate between science and philosophy, we should be wary of using philosophy to dictate to science. A rejection of positivistic philosophy should not be seen as a rejection of positivistic science. Positivism was rejected because it seemed self-refuting, for example, if all meaning comes from verification, then how could we verify the statement 'all meaning comes from verification'? But this self-refutation does not seem to infect science. Scientific results should be verifiable, say. It does not follow that for scientific results to be verifiable that the statement 'scientific results should be verifiable', must be verifiable. Positivistic philosophy and positivistic science are different beasts, so a rejection of one does not automatically lead to a rejection of the other. For Craig to claim that it does so needs further work.

The challenges I set out above were developed out of SR, not Einstein's General Theory of Relativity (GR). SR is 'special' because it focuses on special cases; where frames of reference are either travelling in uniform motion or stationary. GR is a theory that generalises this to take into account accelerating/decelerating frames. GR has come to be seen as a theory of gravity. Some believe that GR can give us an account of a movement or direction of time, and infer that we can use this to generate an A Theory.

Swinburne (1968), for example, argues that we can gerrymander from modern cosmology what he calls a 'principle of similar clocks' (Swinburne, 1968, p. 230), which would allow us to identify clock readings of distant events. Swinburne argues that cosmology shows that a local fundamental particle is employed to set a frame of reference for the local laws of physics. By 'fundamental particle', Swinburne means an 'imaginary frame of reference' (Swinburne, 1968, p. 227). Swinburne focuses on the Doppler Effect and notes that clusters of stars etc., seem to be moving away at the same relative velocities. To account for this consistency in speed we assume there to be a fundamental particle within a cluster of stars which sets out a preferred frame of reference. We posit a recording device within these 'fundamental particles' to derive our descriptions of the universe. This fundamental particle sets out the local physical laws. SR shows problems about signals travelling in space-time. Were space-time to be empty, as SR takes it to be, then recording such signals would require that we had to specify a frame of reference. However, the universe is not empty. The existence of matter means that there is a *preferred* frame of reference in every cluster of space-time. We can use these preferred frames as a base for absolute simultaneity, in a modified form at least.

These fundamental particles allow us to identify simultaneity within a cluster. There is still a problem of simultaneity between clusters that needs to be overcome. Swinburne thinks that we can generate a simultaneity-like notion to develop a concept of an absolute cosmic time. He poses the following dilemma. Take two clusters (A and B) with their own fundamental particles; either kinds of processes, e.g. the ticking of clocks, which occur at one rate in frame A, occur generally at a different rate in frame B, whilst occurring at the same rate as other kinds of processes in A; or each kind of process occurs at the same rate in A and in B. 'Clearly the simplest supposition to make and hence the one which we ought to adopt in the absence of counter-reasons is the latter' (Swinburne, 1968, p. 230). This is the principle of similar clocks. If we assume that clocks measure at the same rate in all frames, and we can gerrymander preferred frames of reference within each cluster of space-time we could, in principle overcome the relativity of simultaneity. 'If the principle of similar clocks can be maintained, we have a method for ascertaining the instant on our clocks at which a distant event occurred' (Swinburne, 1968, p. 231).

Swinburne offers this as a tentative suggestion. I am not convinced that the principle of similar clocks stands up. GR generalises SR to include the effects of acceleration, most obviously identified through gravity. If processes occur at the same rate in all frames of references the relativity seems undone. Relativity is based on the claim that processes vary between frames of reference, yet Swinburne claims, like Putnam (1967) before him, that we can build a notion of simultaneity because processes of the same kind occur at the same rate throughout every frame of reference. This is not relativity, it seems to me, since clocks (and other processes) read different speeds according to their relative motion. Swinburne offers this solution because it is the simplest. Yet we ought not reject science just because it is complicated. This seems like another attempt to reject science in favour of philosophy. I take the counter view, without good ontological reasons, philosophy should not be favoured over science.

Bourne (2004) criticises attempts to use GR to trump SR as mere suggestions without fully explicating the issues. He thinks this unsurprising, since a full exposition of GR does not offer much support. Savitt (2000) suggests that GR may save the presentist but thinks that the hard work needs to be done[67].

I set these arguments aside as contentious at best and prefer SR as our guiding theory. Whilst we *could* use such arguments to overcome the argument from SR, they are contentious at best, and, in Swinburne's words, unless we have any obvious (ontological) counter-reasons to reject SR, we ought to remain within it's parameters. If so, then the argument from SR remains as a hurdle for any A Theory.

3.   *Three Arguments for an A Theory*

Before turning to look at specific arguments in favour of an ontology based on the A series, I wish to distinguish three ways to argue for an A Theory and set out the problems that they need to solve if they are to convince.

1. Those that focus solely on the present. This is a theory that has come to be called Presentism. Only the present is real, the past is no longer real, and the future is not real yet. As a theory, since it rejects the reality of the past and future, Presentism may avoid McTaggart; however, it still needs to deal with SR, since it relies on the present.
2. There are theories that are quiet on the existence of a past, present or future but keen on invoking a dynamic view of time. Call these theories of 'becoming'. Theories of becoming attempt to instantiate dynamism. The problem here is to give an account of what exactly becoming is: if it is universe wide then it seems to conflict with SR; if it is localised it needs to distinguish itself from a B Theory and also explain why there is no mention of such dynamism in SR.
3. Those theories which explicitly adopt a past, present and future. These theories seem to face the problem of McTaggart's Paradox as well as a conflict with SR.

Having made these distinctions I plan to look at arguments which could be seen as representative of each one. I will start with Presentism and work my way through to those that assert the existence of a past, a present and a future.

4.   *Presentism*

One argument that seems to avoid McTaggart's Paradox is the claim that *only* the present *is* real. Whilst the past *was* real, it no longer *is*. The future *is not yet* real, though it *will be* when it *becomes* present. As such since only the present can be

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[67] For a recent attempt see Belot (2005).

real, if X is present it is impossible for it to be past and future as well. Presentism has a prima facie problem with SR. If only the present exists then only those things that are present are real. Yet, as we saw above, the relativity of simultaneity suggests that what is considered real in one frame is quite legitimately recorded as future in another, and past in a third. Each frame is equally legitimate, so we cannot adopt one frame as the true measurement of the universe. Without a universe wide present, Presentism seems flawed.

Hinchliff (1996) argues however that we could reconcile Presentism with SR. Hinchliff thinks that there are two key assumptions behind the claim that SR defeats Presentism. First, SR assumes existence is transitive. We assume first that since event E is real for A, it must be real for B, even though E is in B's future. Second, we assume that Presentism takes on a specific form under SR. In pre-relativistic times, Presentism was taken to be the view that real events for an observer are all events simultaneous to that observer. Under SR we relativise this claim to frames of reference. We say that what is present and real are all those events simultaneous to an observer in a frame of reference. This is what Hinchliff calls 'relativized presentism' (1996, p. 130). These two assumptions are incompatible. For the transitivity principle shows that what is real to observer A should be real to observer B. For any event E considered simultaneous and real to A is not simultaneous and real to B, yet transitivity shows that E should be considered real for B. If transitivity holds then relativized presentism fails.

But there is no compelling reason for the presentist to adopt these assumptions. Relativized Presentism is not the only doctrine of Presentism in a relativized setting. Hinchliff proposes two models which attempt to reconcile Presentism with SR: the first where the present is the here-now, point presentism; the second where the present is the surface of the past light-cone, cone presentism. The transitivity principle is a natural assumption for the first, but not for the second; we do not naturally assume that what is on the surface of the past light-cone of E is also on the surface of the past light-cone of F.

Hinchliff rejects point Presentism because of a challenge derived from Putnam. If we restricted the present to the here-now, then our ontology gets skewed. At event E, events space-like related to it, i.e. those outside of the light cone, are not real. As E falls into the past the surfaces of the light cone spread out, such that at event F, there are events now light-like related to F, so considered to be real, which were space-like related to E so considered to be unreal. The point model 'violates the "conceptual truth" that what *is* past *was* present' (Hinchliff, 2000, S579, original emphasis). Events light-like related to the here now are considered to have once been real. Yet the here–now of earlier times held that those events were space-like related, and so unreal. Something that *was not* real now *is* real, even though it was never here-now. (See figure 3)[68].

At time T, event X is unreal

At time T^{+1}, event X is real

Figure 3
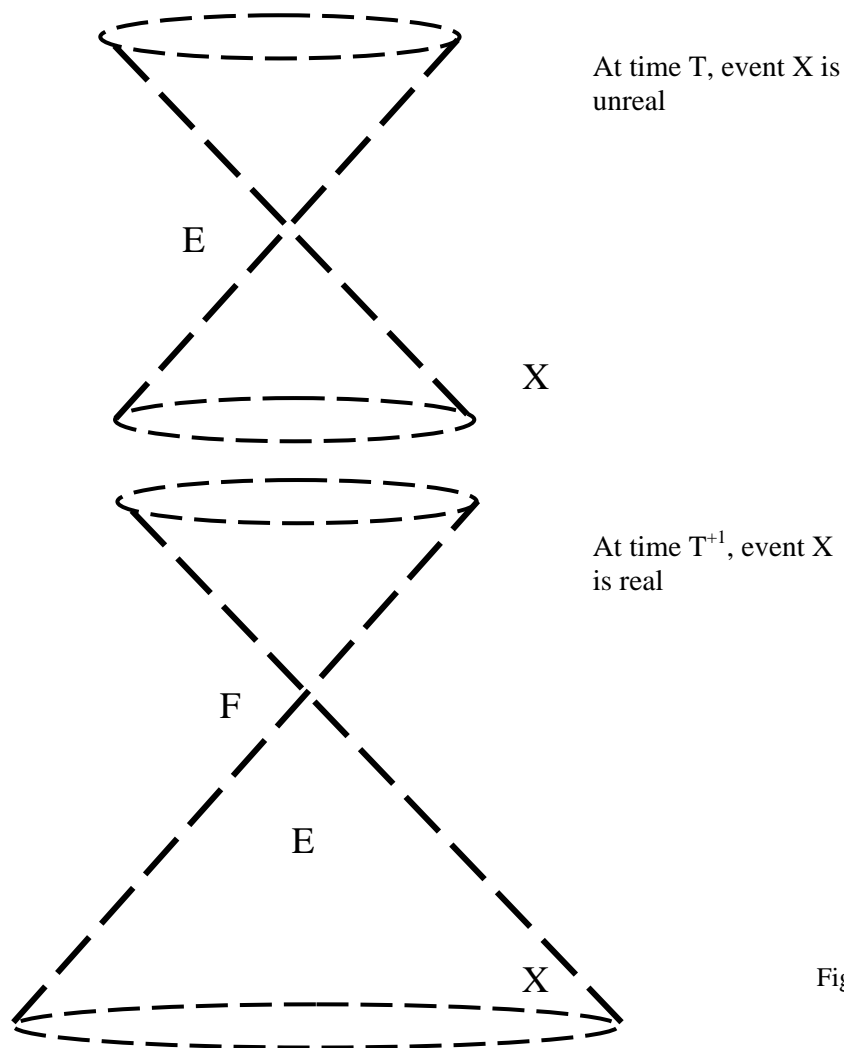
Hinchliff prefers cone presentism, which he thinks is good enough to show that Presentism is compatible with SR. Cone presentism is the view that the present of event E is identified by the surface of the past light cone. Under Hinchliff's construction then, the present is not a universe-wide moment, so subject to the relativity of simultaneity, but is the moment that includes all events/things light-like related to E. Hinchliff claims that this is an invariant notion of the present within SR[69].

Savitt (1998) argues that this arbitrarily selects the past light cone. If we include both surfaces, something Hinchliff calls double-cone presentism, then events are present twice. An event is present when it is on the future light cone surface and again when it is on the past light cone. Well, I think that single events are present three times; as above but also when they are the event the light cone is built around. Hinchliff rejects this move, arguing that the past light cone is not arbitrarily defined, but defined by the arrival of light signals at the event, not the transmission of light signals from the event.

> The surface of E's past light cone is the set of events *from* which a light signal or ray could be sent *to* E. The surface of the E's future light cone is the set of events *to* which a light signal or ray could be sent *from* E.
>
> (Hinchliff, 2000, p. S582)

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[69] Hinchliff, 2000, p. S580.

The trouble is that this reasoning is brought about empirically. If cone presentism is to work as a theory of time, space-time, then the light cone, as a structure in space-time should reflect this direction. It does not. Instead, as we saw above, the division of cones into future/past is arbitrary and as a result Savitt's criticism remains. If we should retreat a little and repeat Hinchliff's claims here, but as empirical evidence, then his is a theory about presentism *in* the universe, not presentism as a property *of* space-time. As such it is quite compatible with non-presentist theories of *space-time* such as eternalism, four-dimensionalism and so on.

Another problem is that cone presentism has to deny transitivity. Here if X is on the surface of E's past light cone, X is, for E, real. If Y is light-like related to X, but space-like related to E, then Y being real for X does not entail that Y is real for E, for Y is still space-like related to E. Transitivity fails. However, on what grounds does transitivity fail? Why should an event, according to cone presentism, present for X so real, not be considered real for E, which is present for X but not for Y? The only grounds available seem to be that transitivity has to fail if the model is to work. That is no reason to deny transitivity. Hinchliff thinks this conception of transitivity is one that holds in pre-relativistic settings. The implication being that in relativistic settings transitivity gets rejected. I think we need more than the claim that we are dealing with SR to justify the denial of transitivity.

Dainton (2001) sees no problem with rejecting transitivity. He thinks it counterintuitive but does not reject it[70]. Dainton thinks that cone presentism involves taking the present to mean the surface of the past light cone, not to be a collection of events occurring simultaneously. This is the definition of cone presentism and I suspect that it just reinterprets SR to make it sound like presentism. As such cone presentism isn't presentism in the traditional sense, just taking part of SR and calling that present, and thus presentism. This is just reinterpretation, not reconciliation of the traditional view with SR.

Hinchliff claims to have reconciled presentism with SR. His argument is not convincing, for even though it is immune from the relativity of simultaneity, the structural requirements he places upon the light-cone are not supported by SR. In fact SR shows that these structures are not real. His theory also just seems to reinterpret SR as presentism, when we really need a reason for the claim that presentism is compatible with SR; reinterpretation of SR is not enough.

5.   *Becoming*

Some argue that the universe is dynamic. But they do not explain this dynamism by invoking a past, present or future; they do not claim that there is a present moment that moves from the past into the future. At best they claim that events come into existence and this is what we mean when we think of time as dynamic. Since there is no past, present and future, then it is not obvious that McTaggart's Paradox is a problem. If every event is present when it becomes, and all events become when they come into existence, we have dynamism but no event being past, present *and* future. The trouble with this claim is a) it sounds like a B Theory, not an A Theory, and b) it does not give an intuitively plausible account of what it is to be dynamic. Moreover, SR is a major obstacle for such a position. I will conclude that SR undermines any theory based on becoming.

Broad (1938b) thinks that time, if it exists is by its nature transitory. He seems to be motivated by McTaggart, and to think that McTaggart is correct to think that the A series is required if there is to be time. He thinks that McTaggart's criticisms of the A series are wrong and that we can base a theory of time on the A

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[70] Dainton, 2001, p. 276.

series. I covered Broad's criticisms in the previous chapter so set aside a repeat of them here. I will instead focus on Broad's attempt to invoke what he calls 'absolute becoming' to see whether we could use it to get an A Theory going. By explicating Broad's position I will develop a criticism that applies to these types of argument; namely that they conflict with science.

Broad focuses on what he calls 'absolute becoming', which does not involve qualitative change, nor motion. To deal first with qualitative change, then motion. We can distinguish between qualitative change when applied to everyday objects, such as billiard balls, and such change as offered as an account of becoming. In the first case a billiard ball may lose some quality, thereby undergoing a qualitative change. Here problems arise about whether it is the same ball (and so on). We can use time to explicate any apparent contradictions. The same ball cannot be both red and white. But if it is red at time T, and white at time T^{+1}, then there is no contradiction.

Broad believes that qualitative change when used as an account of becoming faces two different problems. First, Broad believes qualitative change does not give an account of dynamism. A poker that becomes hot only makes sense if the poker has endured. We might then suspect that McTaggart's criticism applies, i.e. that the poker was cold *before* it was hot and this is static, not dynamic.

Second, Broad believes that qualitative change entails the 'vicious series' argument of McTaggart's Paradox. To use becoming to explain how one event takes on a quality of *being present*, there must be some second dimension where this quality resides. It is when this second-level quality applies to some first-level event that the event *becomes present*. Broad believes that the first-level event is an event particle without extended duration; in its own dimension it has no history. But if presentness moves along this second-level, it does so in the relations of earlier and later. This leads to what Broad calls the inevitable conclusion that an event particle in the first-level has no history or future in its own dimension. But when that event-particle becomes present it has an extended duration and an infinite history in the second level. But these considerations apply to this second level. An event in this second-level must become present and the only way to be consistent, Broad claims, is to apply the reasoning of the first-level to this second-level. This means that second-level events must obtain their qualities from a third level. For presentness to attach to an event, presentness must itself become present, and so on and so forth. We cannot, Broad believes, explain how qualities are acquired and lost.

Broad thinks basing becoming on temporal motion is incoherent. To take becoming as motion, we require a second dimension of time to compare the motion of time. Without this second dimension, the speed of the motion of time cannot be measured. But there is no second temporal dimension and the question of how fast time moves reduces to the question of how great a time lapse has passed in a set time-lapse. Broad thinks this a meaningless question and rejects it, and the notion of motion.

Both moves involve the introduction of a second time series and this enters us into McTaggart's regress. To overcome this, Broad argues that becoming is a basic fact of the universe, and that the regress argument cannot affect this. He argues that the existence of a vicious regress is usually a sign that there has been a mistake. The mistake is made when we think of an event that *becomes* present to be analogous to the claim that some object *becomes* hot.

> We are therefore tempted to think that sentences like "this event is present" record facts of the same kind as those which are recorded by sentences like "this water became hot".
>
> <div align="right">(Broad, 1938b, p. 280)</div>

To say of a substance that it '*became* hot' assumes that that substance persists through time. This substance must have had a temperature before and after the time it *became* hot. But the only thing that can *become* present is an instantaneous event-particle. This means that these further considerations do not apply. Broad thinks that 'absolute becoming' is just a coming into existence.

> To "become present" is, in fact just to "become", in an absolute
> sense; i.e., to "come to pass" in the Biblical phraseology, or, most
> simply, to "happen".

<div align="right">(Broad, 1938b, p. 280)</div>

When we say of something that it '*becomes* present', we are noting an existential change: recording facts of 'absolute becoming'. To explain 'absolute becoming' we do not require a second dimension of time. 'Absolute becoming' is a basic fact of the universe and cannot be analysed further.

Broad's construction of passage does not appear to attract McTaggart's Paradox because to exist just is to be present[71]. So the same event *cannot* be past, present *and* future, it can only be present. This seems to attract the problems set out for Bigelow's modal reading. There does not seem to be any dynamism involved. Broad sets out to give a dynamic account in an attempt to resurrect the A series. However, by claiming that to become present is just to become, he sounds B-ish. An event exists when it exists, and as such this sounds like a claim that events just exist, not a claim that they exist when they become present. Even so, as an account we still do not get an intuitive picture of what the dynamism of time is. A line of three billiard balls exist in their place, and such a picture is static; it does not tell us about a movement from one ball to the next. Similarly, saying that three events exist at their times does not tell us how time is dynamic.

These concerns aside, the major problem for Broad's theory, and those who wish to follow him in adopting becoming is that Broad's theory is incompatible with our best physical science, in the form of the SR. As we saw above, SR suggests that Simultaneity is relative to a frame of reference and not an objective feature of the universe. So Broad relies on a concept of 'absolute becoming' that *cannot* be a basic fact of the universe. Becoming must be relative to a frame of reference; there can be no universe-wide moment when existence *becomes*, since in one frame what counts as real differs significantly to another frame. There is no universe-wide moment when all instantaneous event-particles simultaneous to a present event-particle exist. Recall the example set out above, where A's frame of reference records events E_1 and E_2 as simultaneous, therefore real. Yet in B's frame, E_1 occurs *before* E_2, so exists *before* E_2. Suppose that A and B's recording of E_1 coincide. Then an event (E_2) exists in A's frame, that is not considered to be real in B's frame. But to be real, E_2 must exist even if in B's frame it does not. Both frames are good, therefore measurements made in them count. If existence were restricted to a single universe-wide moment, then we cannot account for such differences. Broad's theory requires that there is such a universe-wide moment. Given that this moment, if it is to be a basic fact of the universe, cannot be taken to exist, we should reject Broad's theory.

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[71] Mundle (1959), points out that whilst Broad's earlier theories are mixed, in that they tend toward a view of time including the A and B series, the later view, as set out in Broad (1938b) is purely presentist; Broad is committed, Mundle believes, to the claim that what exists presently 'is a set of simultaneous event-particles' (Mundle, 1959, p. 367). Broad develops an account of the specious present but 'insists that only an instantaneous cross-section of this total object can be *present* at that moment' (Mundle, 1959, p. 367, original emphasis).

6.   *Past, Present and Future*

I here turn to look at arguments that explicitly invoke a past, present and future. Presentism might claim to avoid McTaggart's Paradox because only the present is real. Presentism still had trouble with SR however. Theories of becoming again might seem to avoid McTaggart's Paradox but clashed significantly with SR. Theories invoking past, present and future are faced both with McTaggart and SR. As such I will argue that they ought to be rejected.

McCall (1994) posits a branching model of the universe to account for the dynamic nature of time. Take the universe to be like a tree, with a trunk and many branches. The Present Moment distinguishes the past from the future. The past has happened and is represented as one line of events. The future is open. The future as of the Present Moment is every possible event, given the history of the universe and the Present Moment. Every one of these futures forms a branch on the manifold of space-time. If event X happens then Y happens, if event Z happens then event Y_1 happens. Y and Y_1 are different branches. At present X or Z *could* occur. When one of these does, say X, the branch with Y_1 drops off the tree. The past forms only the one branch; only one (of the then many possible) series of events took place. Whereas the future has myriad branches. As the Present Moment moves along the branches it slices off those possible (future) events from the actual events, leaving only the one (actual) branch. We can represent this in a diagram:

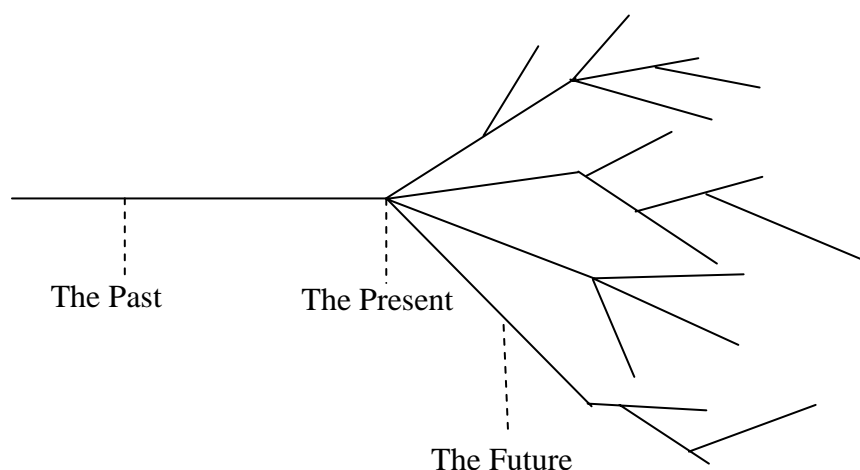The Past   The Present

The Future

Figure 3

This is a far simplified version of a branching universe, but it gives us an insight into McCall's idea. The present moves along the branch, separating the actual events from the mere possible events. One by one each possible branch is cut off and disappears. If the universe were finite, at the end of time, there would only be the one branch. Until that occurs, the moving Present Moment is forever faced by situations like those represented in Figure 3.

McCall acknowledges that his particular model is speculative, but constructs a dynamic theory explicitly invoking the distinction between past, present and the future.

> The universe has the dynamic character it has (according to the model) quite independently of the powers of any rational being to conceive of it.
>
> (McCall, 1994, p. 30)

However, if his model were correct and we are really in what he calls a Minkowski world, then we have our two central problems: McTaggart's Paradox and SR.

I will set aside the first problem, for McCall follows others and relies on the existence of succession to prove that McTaggart's Paradox is a mere sophism. My focus here is on the second problem; McCall's thesis has a prima facie challenge

from SR. McCall invokes the past, present and future; he also places a significant burden on the Present Moment. Given that he relies so heavily on the existence of the Present Moment, we ought to be able to identify, quantify over and describe through the physical sciences that privileged moment in time. Yet as we saw there is no mention of the Present Moment in SR.

McCall acknowledges that the implications of SR make his branching model quite complex. The branches are four-dimensional manifolds. In the past there is only the one branch. In the future there are many possible four-dimensional manifolds. The present is an instantaneous three-dimensional cross-section or hyperplane[72]. Yet SR shows that there is no such unique hyperplane. We cannot globally separate the past from the future because the global hyperplane that divides the two does not exist. For every legitimate frame of reference there will be a legitimate hyperplane which separates the future from the past. It follows that the future (i.e. what is left after the hyperplane cuts the manifold) alters with every change of frame of reference.

> The tree model, then, is quite complex. Not only will the universe
> be different at different times, it will be different at different *frame-
> times*. At any given time, the shape of the universe tree depends
> upon the frame of reference or coordinate system used to describe
> it.
>
> (McCall, 1994, pp. 10-11, original emphasis)

The changes in a frame of reference can be likened, McCall argues, to the change of perspective we adopt of a three-dimensional object, when we move around it. These changes can be transformed away by a shift in frame of reference.

McCall also invokes becoming to develop a theory that does not conflict with SR. Suppose each space-time point were a light and that light goes on only the once. The only way for a bank of space-time points/lights to represent mind-independent becoming is for there to be 'an orderly progression of 'happenings' up the manifold' (McCall, 1994, p. 32). For this to occur events must be placed into what McCall calls simultaneity classes. Again SR shows that these classes do not exist. Every frame of reference has its own simultaneity class, as determined by the simultaneity hyperplane required to distinguish the past from the future in McCall's model. McCall's solution is to claim that each instantaneous picture of the universe is frame relative. Becoming is frame-dependent, not mind-dependent. It follows that the flow of time is frame dependent, but mind-independent.

Both these moves are unsatisfactory. First, if the relativity of simultaneity just involves a change of perspective then it is not obvious that this unique hyperplane exists, beyond a mind-dependent phenomenon. If the hyperplane divides time, i.e. has ontological status a change in frame of reference ought to involve one ontological constant; the shape of the tree at the cut. However, it is not obvious that it does. Indeed McCall acknowledges that a change in frame of reference involves a change in the shape of the tree. The difference in McCall's model is that a 'description of the world relative to one hyperplane cannot be transformed into a description relative to another hyperplane' (McCall, 1994, p. 34). In other words, because the shape of the tree is determined by a hyperplane unique to a frame of reference, it is not possible to change frames of reference. Suppose frame A cuts off branch Y and retains branch X, whilst frame B cuts off branch X and retains branch Y. These two frames are in conflict; you cannot change from frame A to frame B because *from* A, B is *not real*. Symmetrically, from frame B, frame A *is not real*. It seems then that from one frame not everything can be seen as real and unreal. If it is

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[72] McCall, 1994, p. 10.

real it *is* real. If unreal, and on an incompatible branch, then no change in frame of reference is going to make it real[73].

I will raise two concerns against McCall that suggest his theory is undermined by SR. First, as I read it, McCall seems committed to the claim that some frames, contrary to SR, are privileged over others. If in frame A then frame A's readings hold priority over frame B, because frame B *is not real*, whereas frame A is real. Yet SR says that we cannot choose between legitimate frames in this way. But, it seems that it is a conclusion of McCall's theory that we cannot choose, not because both frames are equally legitimate, but because only one of them exists, so no choice is metaphysically possible. This directly contradicts SR. SR is a well-confirmed theory. McCall's model is highly speculative. This suggests that we ought to stick with SR here.

Second, McCall's frame dependent becoming suffers a similar conflict with SR. In his model each space-time point/light gets turned on only once, but in a change of frame of reference it seems to follow, from the relativity of simultaneity, that the same point can be seen as both on *and* off. So if each light only gets turned on once then that light must get turned on independently of any frame of reference. Yet McCall claims that becoming, as represented by the turning on of lights is frame dependent. We need a reason to adopt this claim beyond McCall merely constructing a model of it.

McCall here makes explicit use of the past, present and future and runs headlong into SR. His thesis suffers as a result and I suggest it ought to be rejected. So far I have looked at representatives of different arguments for an A Theory. I turn now to look at the work of Smith who argues in complex way for an ontology based on the A series.

7.   *The Theory of Quentin Smith*

Smith (1993) argues in complex ways in favour of the A Theory in an attempt to disarm McTaggart's Paradox and account for SR. I believe his efforts, like those above, ultimately end up in failure. He develops other arguments so attracts other problems which support this conclusion. Much of the work in this section is exposition and I leave criticisms to the section that follows. Smith's arguments are complex and I think one of the best presented to date, but even so we should not be persuaded.

Smith argues that when we use any tensed statement, that statement refers to a State of Affairs that is itself tensed. Take a simple tensed statement:

(1)   John is running

This statement is tensed because the State of Affairs it describes is tensed[74]. Any attempt to describe (translate etc.) (1) in a tenseless way misrepresents the States of Affairs that (1) describes. A tenseless version of (1) would be a false description of the State of Affairs of John running *now*.

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[73] Talk of events being *real* for A, and unreal for B recall the claims made on pp. 55, whereby events space-like related to B are not considered to be real for B, whereas that same event could be time-like related to A, so real for A.

[74] Smith distinguishes between thick States of Affairs and thin States of Affairs. Thick States of Affairs display many properties, both intrinsic and relational. A way to describe (1) as a thick State of Affairs is to include the subject, John, his relationships, whether he is married etc., his running, the entire motion of running, the relation of running to walking and so on. A Thin States of Affairs in contrast ignores all issues that require us to enquire beyond that immediate moment. A Thin State of Affairs description of (1) only includes John and his running, independent of his life as a whole, the entire motion of that running and so on. Thin States of Affairs only refer to the immediate context described by (1), as such they only include concrete objects and abstract objects as described. Smith believes that both types of States of Affairs are tensed States of Affairs.

Because (1) only refers to John and his running, we only think of it as referring to the one subject (John) and describing that subject through 'is running'. Smith argues, however, that statements such as (1) have more than one subject; for they also refer to the temporal relationship that exists between John and 'his running', i.e. that he is running *now*. (1) appears simple, but is really a complex statement relating John and his running to John's running *now*. To understand this better we can work out his theory by analysing (1).

Tensed statements like (1) are supported by a tensed ontology, involving tensed properties, which are referred to by tensed propositions. Take statement (1) to be a proposition that ascribes a property to John and his running. Smith argues that this property is a property of presentness[75]. Semantics refers to the property of presentness. When we say that 'John is running' we say that as an event, it is occurring now, *and* we are saying that 'presentness' is intrinsically part of that event.

Smith argues that events and objects when they exist *are* present, and this means that presentness becomes both their metaphysical and logical subject[76]. I will deal first with the metaphysical claim, which is straightforward, then turn to the logical claim, which is intricate and needs setting out in detail.

A metaphysical subject belongs to the State of Affairs that underpin our language. In (1) the metaphysics of the existence and motion of John underlie the statement 'John is running'. The use of 'is' reflects the metaphysical state of John and his running occurring *now*. Whilst (1) seems to have only two metaphysical subjects, John, and his running, Smith thinks that presentness is '*the universal metaphysical subject*, that is, the subject of every state of affairs' (Smith, 1993, pp. 134 – 135, original emphasis). This means that every State of Affairs has a metaphysical subject in addition to those made explicit through our language: presentness[77].

Smith thinks (1) also invokes presentness as a logical subject, a subject that is referred to by any tensed sentence. Whilst (1) only explicitly invokes John as a logical subject, Smith believes that tensed statements such as (1) involve two subjects: John and presentness. Just as presentness gets ignored as a metaphysical subject in our description of States of Affairs, it also gets ignored as a logical subject employed by our semantics. Since presentness is a *universal* metaphysical subject, it must also be a universal logical subject. Any description of a State of Affairs also refers to presentness as a logical subject, in addition to the subjects explicitly employed by our semantics[78].

Central to the logical structure of every sentence is what Smith calls the *propositional relation*; which connects the semantics of our language to the ontology that makes it true. There are three functions of a propositional relation:
1. It acts as the truth vehicle;
2. It unifies the constituents of its sentence; and
3. It conveys a relation from the sentence to the property of presentness.

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[75] Smith proposes two definitions of a property:
D1:   A Property =df a property that can be exemplified by something
D2:   A Property =df a property is whatever can be directly, or indirectly possessed by something. Smith prefers D2 and builds his theory around this. Properties are possessed by objects and States of Affairs
[76] Smith, 1993, p. 135.
[77] Since presentness is a subject we can ascribe properties to it. Smith proposes that a second order property of 'inheres in' as a property we ascribe to presentness. In (1) presentness is a metaphysical subject of the State of Affairs of John running, and presentness has the property of *inhering in John's running* (See Smith, 1993, pp. 134 – 141.
[78] Note that Smith argues that presentness is a basic concept of our semantics, which cannot be analysed any further.

I will deal with each in turn.

Smith believes that (1) is only true or false when a propositional relation relates (at least) two entities[79]. Suppose we say that 'John is running'. This gives us the ordered pair ('John's running', and the 'property of presentness'). This ordered pair alone does not constitute a proposition, so no truth-value can be assigned to it. It is only when they become propositionally related that bivalence applies. A key element employed by Smith is logical identity; two sentences are logically identical iff they refer, in the same way, to the same object, and ascribe to that object the same properties. Take two sentences:

(1)   'John is running'

(1')   'Presentness inheres in John's running'

(1) and (1') are logically identical: they ascribe the same properties, presentness and running, in the same way to the same object, John. '[The] present tense of "is" in … [(1)] …is logically identical with the phrase "presentness inheres in" in …[(1')]…' (Smith, 1993, p. 143).

The second function of the propositional relation is to connect John, to his running and to presentness. This is made explicit by the tensed *is* in (1) and by the phrase 'presentness inheres in John's running' in (1'). (1) and (1') link John, the property of running, and the property of presentness through a propositional relation.

The third function of the propositional relation is to connect the semantics of our tensed language to the ontology of the tensed State of Affairs. Propositional relations 'convey' A-statements to A-State of Affairs. In 'John is running', the copula *is* is tensed and conveys a relation between the proposition 'John is running' to the property of presentness that inheres in 'John's running'. The tensed copula is the vehicle for the conveying relation.

Smith has used three ways to explicate the role of the propositional relation in the logical structure of 'John is running'. First, the proposition relation relates two syntactical elements ('John') and ('running'), such that bivalence applies. Second, it relates the constituents of the sentence to each other. Third the *present tense* of the copula *is* conveys 'John is running' to presentness. The present tense of is 'conveys that presentness and John's running are propositionally related' (Smith, 1993, p. 142). This means that presentness must inhere in all States of Affairs. Since presentness is metaphysically tied into a State of Affairs, presentness must act as some sort of truth-maker for propositions[80]. Presentness becomes a necessary but not sufficient truth condition for all propositions. This shows how presentness operates as a logical subject of A-sentences such as (1).

Smith believes that any statement if it is to be true must include presentness, both as a logical *and* as a metaphysical subject[81]. Since most statements refer to other things, such as cars, colours and smells, presentness alone is not sufficient for a statement to be true. Presentness and every other property/event described by a statement must be included in the truth conditions of that statement. Smith moves from a semantic necessity for presentness if our tensed language is to be true, to the ontological claim that presentness exists independently of that tensed language[82].

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[79] I say at least, because, in general, two or more logical/metaphysical subjects are involved in States of Affairs. One might think that we in some cases require only one entity; Consider the case of $\exists x F x$; 'there is a man, such that he is running'. Here the symbolisation suggests that there is only the one entity. Smith believes, however, that there really are two here, the man, an entity, and an action, his running, which we can treat as an event, and a different entity to John.

[80] I set aside any opinion about truth-maker theories here.

[81] This combines type (1) and type (2) arguments, by invoking empirical facts and analytically basic notions to explain our semantics.

[82] In his 2002, Smith puts this differently, arguing that 'there is no tenseless sense of "exists" that cannot be analysed into more basic tensed senses of "exists"' (Smith, 2002, p., 125).

Smith takes presentness alone as a property, which leaves us with a referential problem. Past and future tensed sentences seem to ascribe a property to their referents. If we take the sentence 'John is running' to be a simplified version of 'John is presently running' what property do we ascribe when we say 'John *was* running'? If John is no longer running then how can a property of running currently inhere in John? How can something that does not exist possess properties? Smith's answer is to accept that past and future events do possess properties.

> Past and future items exist in this present tensed sense, since they presently possess properties of pastness or futurity.
>
> (Smith, 1993, p. 165)

One way to correctly ascribe properties to past and future events is to adopt realism towards them. Smith distinguishes between Solipsist Presentism (or Presentism[S]) and realist Presentism (or Presentism[R])[83]. According to Smith we have no more reason to suppose that Presentism[S] is true than solipsist accounts of consciousness[84]. Smith's Presentism involves realism towards the past and future: Presentism[R]. This view is presentist because it takes the Present Moment to be something special, over and above the past and future[85]. Realism about the past ontologically commits us to the claim that past events/objects exist independently of our awareness of them. Smith argues that for a true proposition about the past to be coherent, there must be some State of Affairs that *is* past[86].

8.   *Problems with Smith's Account*

I bring four charges against Smith's argument. First, he does not meet the minimal requirement of removing McTaggart's Paradox. Second, I will show that his ontology is incoherent. Third, I will argue that Smith argues from facts about semantics to facts about ontology. Fourth I will argue that his ontology conflicts with science.

First Charge

Smith fails to remove McTaggart' Paradox. I mention this here merely to recall the minimal requirement set out in the previous chapter for any argument in favour of an A Theory; that McTaggart's Paradox must be solved before the A series can be used as a base for a theory of time. This charge applies to Broad and Markosian but I have left it until now because Smith proposes an intricate solution to McTaggart's Paradox. He claims to solve McTaggart's Paradox by arguing that pastness, presentness and futureness are not held simultaneously, but at different times and this relies on the 'vicious circle' argument; McTaggart's Paradox remains. He proposes a different solution by restating the 'vicious series' argument along these lines:

> Presentness inheres in the presentness of E.
> Presentness inheres in the pastness of the futureness of E.
> Presentness inheres in the futureness of the pastness of E.

Here E is present; E being in the future is presently ascribed to the past of E; and E being past is presently ascribed to the future of E. Smith admits that there is a regress involved here, where presentness inheres in the 'presentness of E'. Smith

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[83] My terminology, not Smith's.

[84] See Smith (2002).

[85] I use realist here in the sense identified by Dummett (1963) and Devitt (1991), as those who believe in the existence of material objects and events independent of humans and distinct from our knowledge of them.

[86] Smith, 2002, p. 279.

claims that this regress is benign, as are all regresses derived from reflexive properties.

Oaklander (1996) is unconvinced by this move, as am I. Smith attributes futurity as a property presently inherent in some past event. Oaklander points out that to attribute presentness *and* futurity to some past event still harbours a contradiction[87]. Oaklander notes that the only way to avoid *this* contradiction is to claim that such properties are inherently ascribed *successively*. Here again, Smith relies on the 'vicious circle' argument to escape McTaggart's Paradox.

To understand Smith's construction we must employ terms such as 'past', 'present' and 'future'. These are terms we are hoping to define within Smith's construction so building them into the definition begs the question. This move is clearly circular and, as McTaggart would suggests, a demonstration of the incoherence of the A series.

Second Charge

The second problem is more specific for Smith and one I call the Lewis/Dainton Problem[88]; which suggests that realists about the past cannot show how we know we exist *in the present*. Compare me in 2007 and Napoleon at the Battle of Waterloo in 1815. In 1815 Napoleon knows that it is 'now 1815'; and in 2007 I know that it is 'now 2007' and that Napoleon is wrong to hold *now* that 1815 is present. Throughout the past, there are numerous people mistakenly believing that they are present, thinking that their time is the 'now'. They are wrong; it is 'now 2007'. Yet when these people held these beliefs they held them because of the phenomenological data available to them. Because of this data their then-present beliefs were true. But why assume that 2007 is 'now'? Because of the data available to me through experience, perhaps. The phenomenology is the same, but luckily my beliefs are true, and Napoleon's are false. But we have no such reason to suppose my present belief that '2007 is now' is any more correct than Napoleon's belief that it is 'now 1815'. It may in fact be 2191, and my present belief that it is 'now 2007' is just as wrong as Napoleon's belief that it is 'now 1815'. If we are realists about the past, our use of tenses fails to tell us when we exist.

In his 2002, Smith develops a theory that can avoid this problem, by invoking what he calls 'degree presentism' where existence is not absolute, but rather, the closer some event is to the present the more real it is. Since it is now 2007, only my belief that it is now 2007 is entirely true. Napoleon still exists in 1815, thinking that '1815 is present', but his existence is only one of degrees, whereas mine now is absolute. The past is not as real as the present; the past exists, but only 'to some degree' (Smith, 2002, p. 133). So it is not now true that Napoleon thinks 'it is now 1815'. Rather it is now true that 192 years ago 'Napoleon thought that it is 1815'.

In one sense, this move fails to solve the problem, since tenses still fail to tell us how much we partially exist. In 1815, Napoleon thinks that 'it is now 1815', but he is only partially correct. It is *now* 2007. Yet, the phenomenology that suggests to me that it is *now* 2007 is the same phenomenology that suggested to Napoleon that 'it is now 1815'. Why should I consider myself to be *fully* correct, and Napoleon to only be *partially* correct? It could still be 2191 and I, in 2007, only partially exist, even though I *appear* to fully exist.

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[87] Oaklander, 1996, pp. 162 – 163.

[88] This problem is posed to the dynamic theorist; one posed independently by David Lewis (via John Bigelow) and Barry Dainton (2001). See also Bourne (2002), who refers to this problem as the problem of presentness, and Parsons (2002), who argues that this problem applies to A-theorists who are realists about the past, e.g. Tooley (1997), and Smith. Note that Parsons and Bourne (2002) both derive their version of this problem from the work of Lewis (1986).

Not only does this move fail to solve the problem, it introduces a second; it introduces a problematic notion of partial existence. Smith construes partial existence as entities lacking non-relational properties. This means that the present confers different relational properties by moving away or towards those entities. Smith explains this by invoking the passage of time. But to show this, we need an ontological argument. Oaklander (1996) argues that any such move cannot be sustained for it is still contradictory[89]. If some event E occurred two hours ago, then on Smith's analysis, being two hours past *presently* inheres in that event, thus present *and* past are attributed to E. We also need a story of why and how these relational properties attach to the past/future events. Without some mention of intrinsic properties, Smith's explanation lacks metaphysical support. If Oaklander is correct then I think that a move to degree Presentism cannot save Smith without this extra support.

Third Charge

The third problem for Smith lies in his employment of tenses to argue for the existence of presentness as a metaphysical fact. Smith assumes that for tensed sentences to be true, we require some property of presentness. This *assumption* is the aim of his theory, to prove that presentness *is* a property. This assumes that our tensed semantics entails a tensed ontology, and no such entailment is obviously true. Tenses and semantics are facts about language, and facts that can be true independent of time itself. Smith moves from a semantic employment of tenses to a tensed ontology and this, as Dyke (2003a and 2003b), and others have argued, can be blocked by the semantic version of the new B Theory[90].

We could argue that the 'is' refers indexically to the presentness of John's experience of running. The truth-value of the sentence is not set by some State of Affairs incorporating presentness; it is set by the time at which it is tokened. 'John is running' is true at time T, iff John *is* running at time T. Here we need not invoke some property of presentness, just note the indexical nature of the tensed copula. The semantics of the new B Theory adequately accounts for tensed language.

Smith has a response here, arguing that 'the truth conditions of A-sentences and tokens cannot be adequately stated by B-sentences' (Smith, 1993, p. 12). Truth conditions for A-statements, expressed in a B-language fail to capture the A-ishness of our A-sentences. Smith believes that a complete account of the truth conditions of A-sentences can only be given using A-language. A-statements ascribe A-properties, and tokens of these statements are true. These sentences are true because of the A-properties they ascribe. A-sentences do not express the same proposition as B-sentences. It follows that A-sentences must *express* A-propositions and *not* B-propositions. Some A-propositions are true, and since these ascribe A-properties to events, these A-propositions *can only be* true iff events possess A-properties, showing that events do possess A-properties. Finally, we could add an important observation that these properties cannot be mind-dependent properties if sentences such as the following are true:

It used to be, but is no longer true that the era without minds is present[91].

This sentence is true. If A-sentences express A-propositions, as Smith believes, then tokens of those sentences have tensed truth-conditions, and the new B Theory is undone. Whilst this move by Smith is interesting we still need an argument in favour

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[89] Oaklander is challenging Smith (1993) on passage, but the point is still relevant to Smith (2002).
[90] See chapter 5.
[91] Smith, 1993, p. 97.

of the ontology his semantics employ. He speaks of tensed properties but we have no reason to believe that these exist merely because the semantics of Smith's theory requires them. We require independent verification and the semantics of Smith's theory alone is insufficient[92].

Fourth Charge

The final problem for Smith's account is that it conflicts with science. Smith needs to give us more of an argument in favour of presentness itself, as a property, rather than inferring the existence of presentness from a tensed semantics. For Smith's argument to succeed we need a reason to suppose that his ontology is true. Reliance upon semantics is insufficient. We could turn to science but the ontology developed through science conflicts with an ontology constructed in terms of the A series. Smith's ontology can also be taken to conflict with science.

We have four reasons to reject Smith's account. He has failed to resolve McTaggart's Paradox; he relies on the 'vicious circle' argument to escape the 'vicious series' argument. Second, his realism towards the past entails that we cannot accurately distinguish between the present and the past. Third, he argues from semantics to ontology, when the argument ought to go from ontology to semantics. Last, there can be no such move from ontology to semantics, since Smith's A-properties etc., conflict with science. On these grounds we should, I believe, reject Smith's account.

9.   Conclusion

One way to reconcile our understanding of time with our experience of time is to claim that our experience is veridical. Understanding our experience of time entails understanding time itself. This suggests that the A series is the true temporal series. If the A series is to be at the heart of our understanding of time then it needs to solve two significant problems; McTaggart's Paradox and SR. As we saw in chapter 2, attempts to resolve McTaggart's Paradox fail because they exploit one version of it to solve the other. Attempts briefly surveyed here have not altered this conclusion. Here I set out SR as a second barrier. If there really are such things as past, present and future then their existence ought not be denied by the best available science.

I have looked here at several arguments in favour of an A Theory, named as such because it argues for the A series as being true of the world. I found all wanting. Presentism came into conflict with SR; becoming conflicts with SR, whilst also sounding like a B Theory, and theories that invoke the past, present and future conflict with SR and need to resolve McTaggart's Paradox. Smith's theory

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[92] Tooley, 1997, argues that Smith's account is one that relies on conceptual analysis alone to prove the A Theory correct. Tooley believes that conceptual analysis only gives us an idea of the conceptual framework within which we are working and has little value beyond this, (Tooley, 1997, p. 248). What Smith highlights here, however, may point towards the need to distinguish, as Frege did, not only between the reference of a sentence and the sense of that sentence but also between the sense and the force of that sentence. The reference of a sentence is its truth-value. The sense of a sentence is its propositional content. We can compare this with force. 'Close the door', for example, can be used in different ways: as a request, an order, an instruction and so on. Here the sense (propositional content) is the same, but the speech act used to express that content has different force. Tensed statements may have a tensed force, whereby there is some force involved in the tokening of that sentence. E.g. 'it is raining now' is made true by the state-of-affairs of it raining at time T and T being simultaneous to the tokening of the statement. The force of the sentence, the reason why it has a specific *meaning*, is provided by the tense. Dummett (1983) believes that simple accounts of language based on truth-conditions ignore the whole concept of *meaning* when meaning is central to language. If so, I think we can see that translating A-statements into B-statements tends to ignore this meaning by focusing solely on the sense of such statements and ignoring the force.

conflicted with SR, failed to solve McTaggart's Paradox and attracted problems of its own.

The failure to solve McTaggart's Paradox and overcome SR suggests that time itself cannot be as the A series describes it. To understand time itself we need to look elsewhere. This means, within the McTaggart debate at least, that time is either best described by the B series, or C series. If this is so, we need to see whether these theories can account for our experience of time. In the next chapter I start an analysis of the B Theory, to see whether that can describe both time and our experience of time. If we are to reconcile our experience and understanding of time, then we need to see why the B Theory is not adequate.

Chapter 5
The B Theory of Time and Direction

1.   *Introduction*
The A Theory cannot adequately explain time as it is understood, so I turn here to look at the B Theory. According to the B Theory, time itself involves the relations of events being before or after other events, or of events being simultaneous with other events. These notions imply that time has a direction, or at least there is a direction in the universe. My focus in this chapter is to look at this claim and see whether it provides sufficient support for the B Theory. As in the previous chapter I do not intend here to provide an exhaustive account of all B Theories. Instead I will raise some of the attractions of adopting a B-theoretic account of direction, and then show that there are significant problems if we are tempted to do so. Still, a certain amount of work with the literature is indicated. The message to be drawn from this chapter is that the direction implied by the B series requires independent support. At present, B-theorists tend to assume that time has a direction.

2.   *Assessing the B Theory*
The claim is that the B series alone is enough to give us time, but this tends to get *assumed*, when what we require is an *argument*. For example, Dyke (2003a) claims that 'temporal reality is constituted by the temporal relations 'earlier than', 'later than' and 'simultaneous with'' (Dyke, 2003a, p. 380). Denbigh (1982) also believes that 'B-statements are sufficient for all purposes of physical science' (Denbigh, 1982, p. 142). Dyke (2003a) also argues that she derives her ontology from the Special Theory of Relativity (SR), inferring that science supports the B-theorist[93]. I will argue that this view is overblown.

B-theorist claims seem obviously true; events occur before other events, which entails that events also occur after other events. Also, some events occur at the same time as other events. World War I, for example, occurred before World War II, and after the Boer War. This claim seems acceptable. The B series appears to give us all we need to distinguish between events as they occur in time. The B series is non-contradictory, events are not simultaneously earlier than and later than and coincident with the *same* event: the paradoxes of the A series do not apply.

B-theorists believe that the B series alone accounts for time and assume that the B series is un-problematically available for their use. But, I argue, this move involves an assumption: that time involves the relations of earlier than/simultaneous to and later than. Dyke (2003a) and Denbigh (1982) make this claim explicitly. Inherent to these relations is a *preferred* direction. Events that are earlier than other events appear to have temporal priority over later events. Since we rejected the A Theory on the grounds that it conflicted with SR, we ought to subject the B Theory to the same test. Whilst the B Theory does not conflict with SR in the way that the A Theory does, I believe the B Theory is under-supported by SR.

This is not to allege that B-theorists just claim support from science. Many include rigorous investigations of the science. I will be looking at, and dismissing, several attempts to cite scientific evidence, as these ignore a distinction between the contents and the structure of time. Some of the lessons of the SR also get lost in the mix. One of those lessons is that the direction inferred by the relations earlier than etc., are not strictly part of SR. I will assume SR for this discussion as the best scientific description of the space-time structure. Based on this assumption, the B-theorist cannot claim that SR shows time to be B-time. Further if the B series is the

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[93] Dyke, 2003a, p. 383.

basic structure of the universe, then we should expect that that the B Theory should give us enough concepts and no more than enough concepts to meet the needs of our science. If the B Theory oversteps the needs of science it then has to give us an *argument* for that claim.

3. *Conclusions that can be Drawn From Science*

If the B series fits in best with the language of science as B-theorists such as Mellor (1998) have argued, then we can look at the role time plays in the equations of the science of the universe. It turns out, I will argue, that the language of science does not employ B-terms. So claims based on science do not provide the support the B-theorist wants; there is no mention of the earlier/later distinction. Science only requires that we distinguish between events that occur simultaneously and those that do not[94]. For this, all we need is the C series and no more than the C series.

Time is tied into the equations of SR. These equations use spatial *and* temporal relations; where time is the fourth dimension of four-dimensional space-time. Time has a physical presence, and we ought to take time as real[95]. This is the most that we can assert. That time has a physical presence does not support the B Theory as much as is thought. The B Theory uses notions such as earlier and later, and this, McTaggart pointed out, has built into it a direction[96]. The B series is anisotropic. But the temporal axis in physical theory is isotropic; there is no intrinsic direction. The B series assumes a direction in time, a direction not within SR. Any account that thinks science does use the B series needs to show how and why science employs it.

Recall the light cone (set out on pages 50 and 51). As we saw, if we take the light cone as the basic structure of space-time in SR, then that structure is symmetrical. The areas of the light cone designated as future and past, or earlier/later, are mere conventional labels, not representative of the universe itself. If so, then SR does not support the B Theory as well as is thought. We may be able to use earlier than/later than and (local) simultaneity in our physical talk. This is different to the physical description of such properties[97]. The concerns that removed the A Theory also challenge the B Theory. The laws of physics are time symmetrical, and this entails that there is no preferred direction in time. However, the use of B Theory terms implies such a preference. But SR rules this out[98].

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[94] Quine, 1960, makes an analogous point about mathematics and science; 'the reason for admitting numbers as objects is precisely their efficacy in organizing and expediting the sciences' (Quine, 1960, p. 237).

[95] See Minkowski (1908) on the connection between time and space in a four-dimensional modelling of space-time.

[96] See McTaggart. 1908, pp. 462 – 464.

[97] We can use the terms to refer to the relationship between events *in* time, for example, and this counts as physical talk, but this is quite different to using these terms to refer to time itself.

[98] Earman (2002) argues that neither can GR give us the B series; it does not give us the change required if we are to say that one time is earlier than another. Earman believes that whilst a textbook reading of GR can get us a B series, a deeper reading removes it. What counts as ontologically real is that which remains after 'gauge freedom' has been removed. In well behaved theories, specifying the values for dynamic variables at the initial stage determines the values of those variables at all times. Gauge freedom occurs when the equations of dynamic variables do not behave over time. Instead of *one* solution consistent with the initial data, there are many solutions. Belot (2002) argues that gauge freedom is undesirable, 'for one expects a classical theory to be deterministic, in that the physical state at one time determines the physical state at all times' (Belot, 2002, p. 1). Earman argues that in theories with gauge freedom, we ought only accept as real those entities that remain after this freedom has been removed. GR is such a theory, and once we remove the gauge freedom from GR, the B series disappears.

Maudlin (2004) argues that Gauge Equivalence is not a given fact, but under certain forms can be seen to be a postulation. Here, Gauge Equivalence is not described but built into the initial set

SR shows that time does not involve the relations described by the B series. The B-theorists needs to give us an argument for the B series being part of the physical world. B-theorists have tended to help themselves to the direction of time, but this is an assumption on the B-theorists' part. Even if we take the A Theory as being false, the A-theorist gave us arguments for his theory. The B-theorist must also give us an argument.

4.   *The Distinction Between the Direction of* **and** *the Direction* **in** *Time*

B-theorists tend to argue that the direction of time is empirical, but contingent. What we call earlier events *could* have been later events, but just happen, in the real world, to be earlier events. The direction here is an empirical discovery about time. This I believe is the dominant strategy used by B-theorists. I believe that attempts to date to employ this strategy have rested on a blurring of the distinction between the direction of time itself, and the direction of objects and events *in* time[99]. I intend here to set out this distinction.

We can distinguish between the direction *of* time and the direction of events *in* time. Think of a green wine glass filled with water. The fact that the glass is green is a fact *of* the wine glass. That the water in the glass has a glass shape is a fact about the water *in* the glass. That the water in the glass looks green is a fact about *our* experience of the glass of water.

We can get a better understanding of this distinction if we take a brief look at General Relativity (GR) to show that we attribute a property to the structure of space-time something not wholly a property of that space-time, in this case gravity. According to GR the presence of mass/energy in space-time warps space-time to produce what we know as gravitational effects. This means that gravity is something that happens in space-time and is not a property of space-time itself. If gravity is an effect of things *in* space-time it should not be taken as a property of space-time, independent of those things[100].

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up of the model. The very act of removing the gauge freedom, removes the dynamics required for the B series. Furthermore, gauge freedom only applies to instantaneous states, but Maudlin points out, this requires a notion of absolute simultaneity not possible within GR.

Earman's response focuses on the practice of scientists; there is common agreement in the science community (as opposed to the philosophy of science community) that there *is* a uniform method for removing gauge freedom. This is a transitive relation, not relying on absolute simultaneity.

[99] Compare this with two other strategies available to a B-theorist; he could either invoke a priori reasoning or empirical necessity. First, the B-theorist could argue that the direction implied by the notions of earlier than and later than are discoverable independent of experience. To do this he has several options. He could argue that such notions are analytically basic, not analysable by any other (more basic) notions. This is a semantic concept, independent of experience, so qualifies as a priori. He could, in similar vein, argue that these notions are the only way to develop a clear, and consistent theory. These are just two ways to develop an a priori account. I think the strength of the B Theory is that it avoids using semantic issues to decide ontological ones, and am not convinced that a B-theorist would find such strategies attractive.

Second, the B-theorist could argue that the direction of time is grounded in physical facts about the universe that are themselves, empirical, but necessary. Kant linked necessity with the a priori, but others, notably Kripke (1980) have rejected this. Kripke poses a challenge. If we were to ask whether the world we are in could have been different and answer no, then this fact about the world is a necessary, but empirical, fact. Kripke uses the example of the Goldbach conjecture, that an even number greater than 2 must be the sum of two primes. If this is true, it is necessarily true, if false, necessarily false. If the B-theorist could develop a theory that is empirical but necessary, then the B Theory is the reasonable theory of time. I believe that no B-theorist has yet demonstrated that the direction implied by the earlier-later relations is necessary.

[100] GR rests on the Equivalence Principle, which, generally stated, holds that physics in a free fall frame is consistent with SR. '[Physics] appears the same to any observer in free fall whatever the

In GR the shape of space is tied into the contents; we cannot delineate cleanly between this content and space-time. Gravity in GR is a reflection of the changes in the geometry of space-time, brought about by the presence of mass/energy. The presence of mass/energy causes the curvature of space-time and in turn this curvature influences the paths taken by, and available to, mass/energy. We cannot easily decide whether gravity qualifies as a property of space-time or as the contents of space-time. Gravity is an effect of the relationship between space-time and the mass/energy of its contents. But if we were to strictly focus on space-time, it would be hard to say that gravity is a feature of that space-time simpliciter. In the absence of mass/energy, we would not feel gravitational effects. So it is with time. The direction we observe, measure etc., is often the direction of events *in* time, not direction *of* time.

The direction of time cannot be taken to be a property of space-time simpliciter. We can distinguish between the motion of an event, an explosion say, and the motion of time. The event has a beginning, middle and end. This is a direction of that event; the beginning is earlier than the middle and so on. This is a description of an event *in* time.

Reichenbach (1956) made another distinction, which could be pertinent here. Reichenbach distinguishes between time order and time direction. He was interested in showing whether a time order, based on causation, could be the basis for the direction of time[101]. This is a distinction that needs more focus, and I introduce it here to show that we can accept an order of time without accepting a direction of time. I think that we may be tempted into thinking that one follows naturally from the other. Reichenbach thinks direction is a property of the causal net as a whole, so once we have a time order we can get a time direction. I think this needs an extra argument (which Reichenbach provides). Here I just introduce the distinction because I will later build the C series around a concept of temporal order, independent of temporal direction.

What we need is an account that shows that time itself has a direction, one that shows that earlier than is a property *of* time, not events *in* time. We also need accounts that show that temporal order is enough to give us temporal direction. There are several arguments that are available to the B-theorist. I will look at four: the causal theory of time; the fork asymmetry; the second law of thermodynamics; and the radiation asymmetry. I will set these out and show why we have reasons to

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magnitude of the gravitational field' (Kenyon, 1990, p. 4). The Equivalence Principle comes in two forms, weak and strong.
The Weak Form (WEP): The motion of a neutral test body released at a given point in space-time is independent of its composition; the effect of gravity on an object is not determined by the composition of that object.
The Strong Form (SEP): There are three points to the Strong Form:
    1.   The results of all local experiments in a frame in free fall are independent of the motion.
    2.   The results are the same for all such frames at all places and all times
Physics becomes the same in all free falling frames and is consistent with SR. This leads to a rider for SEP.
    3.   The results of local experiments in free fall frames are consistent with SR.
Space-time becomes a patchwork of free falling frames.
     It follows from the WEP that the curvature felt as the force of gravity is a curvature in the fabric of space-time. But this curvature is brought about by the presence of large bodies of mass, stars and planets etc. This suggests that the fabric of space-time independent of its contents is flat and straight. In the absence of mass/energy then space-time is SR space-time. If that is the case, and SR cannot give us a direction of time, then GR cannot give us a direction of time. The most we can get from cosmology is the direction of the contents of time.
[101] Reichenbach, 1956, p. 108.

reject them. They only give us reason to suppose that the contents of time have a direction, not that time *itself* has a direction.

5.   *Causal Theory of Time*

Causation is a fact of the world and basing time on this may give direction ontological status. My existence was causally brought about by the interaction of my parents. Since I am real and really the effect of this real interaction, if time follows the direction of causation, then the direction of time is real. This gives the B-theorist the asymmetry he desires.

A Humean can respond here that since we distinguish between a cause and an effect by saying that the cause occurred *before* the effect, then any account of the direction of time based on causality begs the question. We define the cause as being the event *before* the effect and then claim that time follows the direction of causation; we are saying that the earlier time occurs with the cause, yet we only identified the event *as a cause* because it occurred earlier than its effect; clearly a circular argument. If we only distinguish the cause from the effect by invoking the direction of time, we are not free to then base the direction of time on the causal direction.

But not all theorists think that the causal relationship is merely definitional. Mellor (1998) thinks that if event C is taken to be the cause of event E, then C both explains E, and provides a means for bringing about E. This shows C to be the cause of E. The effect does not explain nor provide the means for C. There is an asymmetry here, one not merely definitional[102] and Mellor maps the temporal asymmetry onto this causal asymmetry.

But this move is not so obvious. A cause explains and provides the mechanisms for the effect. This does not show that the cause happens *before* the effect. It is quite possible that the cause comes after the effect, since Mellor's account only requires an asymmetry, but no preferred asymmetry. His account so far cannot rule out backward causation and, if so, we cannot reduce the temporal asymmetry to the causal. But Mellor thinks it is not possible for an effect to precede its cause. Only causes precede their effects. "What gives time its direction is not irreversible processes…, but the direction of causation, i.e. the asymmetry of the cause-effect relation" (Mellor, 1998, p. 121). That there may not be enough causes to generate a time order carries little weight. It is enough, Mellor thinks that one event at time T, is the cause of another at time T^{+1}. "[All] we need, for causation to fix the time order of any two spacetime points…, is – in this case – that *some* fact C at *t* causes *some* fact E at *t'*" (Mellor, 1998, p. 113, original emphasis).

I have two responses to this, first it seems to be a deferred definitional move and needs restating; second, Mellor blurs the distinction between the direction of events *in* time and the direction of time itself. First, to escape the possibility of backwards causation, Mellor thinks it sufficient that some event C is the cause of event E and that C's time T, is earlier than E's (T^{+1}). He thinks that C's B-time precedes E's B-time because C precedes E, but this notion of C preceding E is temporal. Mellor has assumed that C occurs before E to prove that C's B-time precedes E's B-time. In effect, Mellor has defined time T as earlier than time T^{+1} and transferred those definitions to the events. The Humean response still stands.

Mellor could respond here that this objection is a result of our experience of causes bringing about their effects. My interpretation of 'precedes' as a temporal notion is a reflection of this temporal perspective. But 'precedes' need not be temporal. We can characterise it in another way to remove any temporal bias. If the

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[102] Mellor, 1998, p. 107.

time order follows the causal order, it follows the order by which causes *bring about* their effects, and *bringing about* is not a temporal notion. It is a causal notion. This gives us the temporal asymmetry, which just happens to follow the direction of causes *bringing about* their effects[103]. Time proceeds from earlier to later because causes bring about their effects. Causes don't precede their effects because of the time order. I think this a reasonable view. However, it only works if we do not distinguish between the direction of things *in* time and the direction *of* time itself. Introduce this distinction and the theory loses much of its appeal.

Second, Mellor's causal theory does not show that time has a direction; it only shows that the contents of time have a direction. He claims that the difference between a time and an event is that not all causal facts are existential facts about events, but that they are existential facts *about* time[104]. Causal facts have moments or intervals as their locations in time. But all this shows is that an event occurs *in* time. Any direction of events can only be demonstrated to occur *in* time. No direction *of* time follows from this. My table has four legs and is in my kitchen. It has a location in my kitchen. It does not follow that my kitchen has four legs. My kitchen has four legs *in* it, but does not itself have four legs. Mellor needs to give us an independent reason for supposing his theory to be about time itself, not just about the contents of time.

This still leaves backwards causation. Price (1997) thinks our intuitions about temporal direction have been removed from the macro level; we recognise that the direction of time is a reflection of our perspective as agents in time, and subject to the second law of thermodynamics. But these intuitions still exist at the micro level, where backwards causation is only denied because of our temporal perspective. We reject backwards causation out of hand because we are accustomed to experiencing forwards causation. If we remove this perspectival bias some of the weird results from Quantum Mechanics can be explained, because a present effect can be explained by reference to a future cause. If so, then causation cannot give us direction because it goes in both temporal directions.

Dummett (1954) denies that we can explain a present effect by referring to a future cause. An explanation based on backwards causation rests on three requirements, which prove that backwards causation to be irrational. The requirements are; first, the earlier event E, could not possibly be explained except by reference to its later cause, call it C*; second, we could not think of C* as *not* being the cause of E; third, we would need to be able to provide a good and fully worked out causal account of C* without reference to E. But since these events are in the future, and yet to happen, we have no such transparent causal explanations. Reliance upon future causes for reasoning cannot provide a transparent causal analysis of the cause-effect relationship. If so, then we have insufficient reason to act upon present events, if we suppose them to have been brought about by future causes. Dummett thinks it would be irrational to reason based on future causes to present effects. But a claim to irrationality is no argument against backwards causation; it merely shows that backward causation is seriously weird. But I set the issue aside as contentious[105].

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[103] In places, Mellor does seem to countenance backwards causation, but thinks these so rare that at best they give us a locally reversed time order (Mellor, 1998, p. 114). If so, then my second criticism stands, that Mellor is really talking about the contents of time, not time itself.

[104] Mellor, 1998, p. 112.

[105] In his 1964, Dummett thinks that the causal asymmetry is not merely a verbal asymmetry, but is grounded in genuine ways that the world is. Here a cause must be seen as necessary to bring about an effect. If an event E has a later cause C*, then it must make sense to speak of doing C* to bring about E. This is a similar claim to the one set out above.

The causal route either defines the time order and is subject to the Humean response, or it rests on blurring the distinction between the direction of things *in* time and the direction *of* time itself. Without this blurring we have little reason to rule out backward causation beyond Dummett's claims to irrationality. So causal direction is not sufficient to demonstrate temporal direction and the B-theorist should look elsewhere to develop an ontological account of the earlier/later relationship.

6.   *Horwich's Fork Asymmetry*

Fork asymmetry might give the causal claim some help. Horwich (1987) takes *knowledge* asymmetry to represent the direction of time: we know more about the past than we do about the future. Horwich claims that the direction of time, as represented by the knowledge asymmetry, is best explained through the fork asymmetry. Fork asymmetry holds that if there are two correlated events, A and B, it is more frequently found that their correlative event, call it C, occurred *before* A and B, not afterwards.
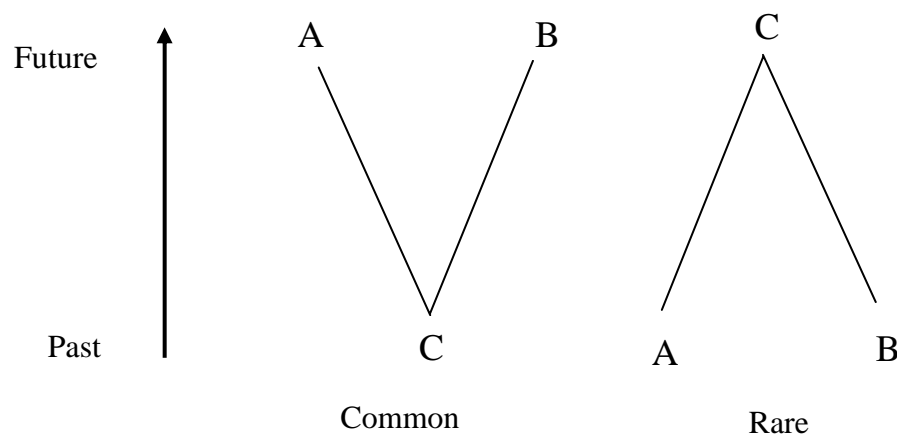

Figure 1

Events tend to be correlated because of mutual dependence on an earlier event, rarely because of later events. My turning a switch both creates heat, light, motion and sound i.e., I've just detonated a bomb. The various effects of the explosion are all correlated with the one prior event, my turning the switch. Forks tend to be open towards the future, not towards the past. Fork asymmetry becomes a constitutive component of the distinction between a cause and its effects. Reichenbach (1956) talks of this in terms of the principle of the common cause.

Horwich believes that whenever two events are correlated, they are, of necessity, embedded in a V-shaped chain. There is no requirement that these two events be in a ∧-shaped pattern. All other asymmetries can be traced back to the fork asymmetry.

> The rough idea – *very* rough – is that the fork asymmetry leads to the contrast between our knowledge of the past and ignorance of the future and that this epistemological asymmetry has two important consequences. First, it fosters the idea that the past is in some sense 'more basic' than its future, and thereby inclines us to *explain* the future in terms of the past, and not vice versa. Second, it implies that rational action (since it involves a process of *discovery*, during deliberation, of what is to be done) must be oriented toward the future – which explains why we *care* more about the future than the past.
>
> (Horwich, 1987, p. 199, original emphasis)

Horwich suggest that perhaps we have an explanation for temporal direction.

However if the fork asymmetry is to do the job we require of it, that asymmetry ought to be universal. It turns out that the fork asymmetry is not universal. If so, then we cannot base the direction of time on it. Price (1997) thinks fork asymmetry fails at the micro level. On the assumption that Quantum Mechanics is true, if there is no fork asymmetry at the micro level, there can be no *necessary* explanation for the direction of time *based on the fork asymmetry at the macro level*. Price argues that the global direction only exists at the macro level; there are not enough forks at the micro level to support Horwich's theory. If we assume that macro objects are causally determined by their micro-states then the fork asymmetry is insufficient; there are not enough forks at the micro level to support Horwich's claims.

This still leaves us free to take the fork asymmetry to be a macro only phenomenon, as Reichenbach does. Reichenbach thinks that the principle of common cause is derived from the second law of thermodynamics[106]. Price argues that there are not enough forks at the macro level to support Horwich's theory. 'The fork asymmetry doesn't provide enough *actual* asymmetry in the world' (Price, 1996, p. 140). This undermines Horwich's employment of the fork asymmetry, at the macro-level.

If the fork asymmetry were the underlying causal structure of the world then we should take it to be universal. Price believes, and I agree with him, that there are not enough objective forks at the micro level to support Horwich's claim. If we reject the fork asymmetry, then we cannot base the knowledge asymmetry, or any asymmetry, on it. We have reason to reject Horwich's argument.

7.   *The Second Law of Thermodynamics*
The Second Law of Thermodynamics holds that an isolated system tends to move from a state of order to a state of disorder. The current state of the universe is one where energy is concentrated into a few structures (stars). Over time, this energy will radiate from these structures into space in the form of heat, light etc. This movement of energy will cease when it becomes evenly distributed in space, called a state of equilibrium. Energy has moved from an ordered state into a disordered state. Entropy is the technical term used to describe the state of the energy distribution of systems. Entropy tends to increase rather than decrease. Rarely do stars form out of energy moving through the universe. The direction of time is derived from the movement of the universe from a low state of entropy, towards a state of equilibrium.

> The flow of time becomes apparent because there is an inexorable
> tendency in any system left to its own devices for organisation to
> diminish and randomness to increase.
>   (Coveney & Highfield, 1991, p. 147

I will develop here an account proposed by Grunbaum (1973), who believes we can build the anisotropy of time into the fabric of the universe through the second law. Grunbaum argues that we can derive an anisotropic topology of time through the stipulation of coordinates. He believes that once we derive a temporal relation of between-ness we can generate two senses that oppose each other. We then assign higher coordinates to the one sense and lower to the other. Take a sequence, M-N-O-P, to be successive states of a house that burns down. M is the start of the fire, and P the house in ruins. This, says Grunbaum, gives us a first approximation of direction, for a reversal of the fire would see the house constructed out of debris. The house could only be reconstructed if time were reversed. This gives us an initial account of anisotropic time, 'because of the existence of irreversible kinds of processes, [then]

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[106] Reichenbach, 1956, p. 157.

the time continuum is anisotropic' (Grunbaum, 1973, p. 209). But, Grunbaum concedes, this only gives us anisotropy at a local level, and only of the physical contents of time. The anisotropy is only involved in the fire and the house, *not the surrounding area*, nor time itself. If this is so, then I believe we cannot derive 'the' direction of time from local anisotropy.

Grunbaum's response is to claim that were we to derive a sufficient number of local asymmetries we could build an anisotropy of time itself. We employ the direction of entropy increase of 'a typical representative' of the majority of the branches of the universe to define the sense of one side of the series being 'later than' the other. He believes that 'the statistical character of my "definition" of "later than" does not disqualify it' (Grunbaum, 1973, p. 280).

I will raise three reasons why entropy cannot give time a direction. First entropy increase is only a statistical probability, not necessarily true. Second, the application of thermodynamics to open systems is itself contentious. Third, Grunbaum's solution may seem an escape route but this is barred by the distinction between the contents of time and time itself.

First, the second law of thermodynamics does not give us necessity; entropy increases are only more *probable*. Grunbaum, we saw invoked probability for his theory. But even were we to claim that the second law applied to time as a whole, not just contents, we still could not escape the problem of it being only probabilistic. Decreases in entropy, though highly unlikely, are not denied by the laws of thermodynamics as set out by Boltzmann. Dainton (2001) says that this shows that any system that is in a high state of order is likely to be in a more ordered state at earlier *and* later times[107]. If the universe is viewed as a complete entity then what we find is a vast array of disorder, with occasional, and 'massively improbable (but statistically inevitable) order in a vast sea of disorder' (Dainton, 2001, p. 49). Entropy levels are therefore likely to be higher before *and* after low levels of entropy. The second law does not give us the necessity required for a universal temporal direction.

Second, Dainton thinks we cannot apply the second law of thermodynamics to the universe in any legitimate way. The laws of thermodynamics were developed to explain closed systems, notably steam engines. It is not legitimate to apply these principles to systems that are not at all like steam engines. When we see a footprint in the sand we assume that the second law of thermodynamics can be used to explain our assumption that this footprint was placed in the sand *in the past* instead of the future. However, the beach is an open system, *not* a closed system, and Dainton claims that the second law does not obviously apply. Thermodynamics explains the workings of closed systems, and things such as humans, beaches etc., are open systems; they constantly interact with other systems. The footprint in the sand was not brought about by the highly unlikely movement of the sand into the form of the footprint, but the interaction of the beach with an animal.

Dainton concludes that there is no obvious links between entropy increase and many of the asymmetries that we observe and associate with the direction of time. This undermines any attempt to use the second law to explain the direction of time. Popper (1956b) argues that for an increase in disorder, walls are required; yet a thin gas expanding in a 'vessel without walls' does not lead to an increase in disorder – and Popper likens the universe to a vessel without walls[108]. The tendency of entropy to increase over time only applies to closed systems, and the universe is not a closed system, so this movement in entropy will not occur.

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[107] Dainton, 2001, p. 49.
[108] Popper, 1956b, p. 382.

Third even were we talking about a closed system, thermodynamics only gives direction to the contents of time, not time itself. If the system were closed, we would be talking about what is in the system, not the system itself. Grunbaum's solution fails this test. He believes that we can invoke a sufficient number of asymmetries to gerrymander an anisotropy of time. But he moves from the direction of the contents of time to time itself and this move is not acceptable. That the contents of time have a direction is no proof that time does.

We have three reasons to reject the second law of thermodynamics; it only provides probable asymmetry; the legitimacy of employing them is subject to serious doubt; and it moves from an asymmetry in contents to an asymmetry in time, in at least Grunbaum's version of it. The second law cannot give the B-theorist the support he needs in favour of the B Theory.

8.   *Radiation Asymmetry*

Radiation only takes the one form: a wave spreading out from an emitter. Popper (1956a) argues that the collapse of a wave into a sink never happens. Does this give us the required asymmetry? Whilst it appears that radiation asymmetry may do the work of fork asymmetry, we will see that it reduces to the asymmetry of the second law of thermodynamics, and as such, cannot do the work required for the B-theorist.

There is a debate about the claim that radiation asymmetry is based on thermodynamic asymmetry. Popper (1956a) argues that radiation asymmetry is not reducible to thermodynamics. Take the dropping of a stone into a lake. The stone enters the lake and coherent waves radiate outwards. The inverse never happens; waves do not concentrate on a centre and throw out a stone. We could film the stone falling into the lake and then reverse the film to see what a reversal might be like. Popper argues that for this to happen, a vast array of distant 'coherent generators' would have to come into effect[109]. Popper concludes that irreversible processes do occur within classical mechanics.

Price (1997) argues that Popper has failed to identify the effects of boundary conditions, of contingent physical constraints, which are thermodynamic in nature. Examples like the stone flying into water and causing outgoing waves are common because their initial conditions are common. Our region of space is in a low entropic state, so energy will be concentrated into stars etc. If our space were in a state of equilibrium, there would be no such concentrations, the energies in stars will have spread out into space and the incoming stone would be no more likely than the outgoing stone. In a state of equilibrium, the initial conditions of radiation asymmetry would not be common. Price concludes that radiation asymmetry depends on thermodynamic asymmetry; thermodynamic asymmetry provides the background against which radiation asymmetry can occur. '[The] asymmetry of radiation is not a separate problem to that of thermodynamics' (Price, 1991, p. 143). Any claim that radiation asymmetry can provide a direction for knowledge asymmetry is subject to the same limitations of claims based on thermodynamic asymmetry[110].

9.   *B Theory of Time?*

These theories provide a sufficient account of the direction of the contents of time. I am not convinced that these accounts actually qualify as an account *of* time itself, when their focus is only on the contents of time. It would be like providing a

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[109] Popper, 1956a, p. 538.
[110] Including the claim that it is about the contents of time, not time itself.

theory of wine glasses by describing the wine. Here you would still get an idea of the shape of the glass, the position of it etc., but the theory is not really *about* the glass, but is about the contents of the glass, the wine. If this is the case then providing an account of the direction of the contents of time is not enough to give an account of the direction of time, and may fail to qualify as a true theory of time itself.

The B Theory does qualify as a theory of time when it gives an account of time, independent of these contents. If so, then I am not convinced that these accounts are B-theoretic accounts. They seem to me more like unrecognized C-theoretic accounts. Time itself gets described in terms of the C series upon which the B Theory gets developed. This suggests that the B Theory is not significantly different to the C+A Theory. The C+A Theory makes the first step more explicit; time is described by the C series, the contents described by the B series and our experience described by the A series. The first step often gets assumed by the B-theorist; making it explicit qualifies as a C+A Theory. Ignoring it seems just to be an undeclared C+A Theory. Price (1997) for example, takes the direction of time to be a result of our perspective of being *in* time and subject to contingent forces within time, such as the second law of thermodynamics. This sounds remarkably like a C+A Theory.

If so then the only real difference between the C+A Theory I am promoting and the B Theory is that the B Theory tends to assume that the relations earlier/than etc., are well supported by science. They may be supported by sciences that deal with entities *in* time. They are not supported by SR. The C+A Theory just makes this more explicit. As such, the two approaches are compatible, but the C+A Theory is, I believe, the more accurate theory and should be preferred to the B Theory.

10.   Conclusion

I have looked at attempts to employ external accounts to explain the direction of time. Such accounts are insufficient either because they disappear at the micro-level, being reflections of the focus of our conscious attention, or because they are contingent asymmetries, that do not hold of necessity. If so then this direction is not tied into time itself, but only count as part of the contents of time. None of the accounts above give us enough evidence to generalise the claim that asymmetries in the *contents* of time demonstrate there to be an asymmetry *of* time itself.

This means that the B-theorist cannot assume the direction of time. The direction of time has to be argued for. The arguments surveyed here *are* enough to show that there are asymmetries *in* time, so the B-theorist can acceptably hold that these asymmetries are an objective fact about *events* in time. What he cannot do is take these objective facts to be facts *of* time itself. The B-theorist needs to provide an argument for the B series. If the B-theorist is to argue for the B series he cannot assume the series is true, that would make his argument as circular as the A Theory. The B-theorist needs to argue for the asymmetry of the B series. Some of the above arguments may well be sufficient for that. But the B-theorist cannot invoke the B series in his argument: the B series is his conclusion, so he needs to begin elsewhere. The natural place to start would be the C series. This suggests that the B Theory *might* not be a theory of time at all. When it becomes one it sounds more like a theory based on the C series, making it a C+A Theory, not a B Theory.

The B-theorist is not only concerned with explaining the direction of time. The B-theorist also wants to explain the meaning, and our use, of tenses. I turn in the next chapter to look at the semantic issues raised by the B Theory and show that in one form, the B Theory is an adequate explanation for our temporal language.

Chapter 6
The Semantics of the B Theory
and the Challenge of Experience

1.   Introduction

In Chapter 5 I showed that whilst direction is an objective feature of the universe, that direction is really only the direction of the contents of time, not time itself. As such, the B Theory is a good theory about the contents of time, but not about time itself. I turn now to a more traditional problem faced by the B-theorist: how to account for our tensed language. There are two issues involved here; first to account for our use of tenses without invoking a tensed ontology; second, to explain why we have tenses in the first place. The A-theorist accounts for our use of tenses through a tensed ontology; we use them naturally as names. The B-theorist cannot take tenses as names, per se, but can, I think account for our use of tenses. I will conclude that the New B Theory, providing tenseless truth-makers for tensed statements can account for our use of tenses.

The second issue is more intransigent. Our language is tensed. When we refer to actions and events we say that they are either occurring now, have occurred or will occur; we naturally explain events by employing tenses. The A-theorist claims that we have tenses because time is tensed. But as we have seen, this claim is unsupported at best. If time is tenseless as B- and C-theorists claim, we need an explanation for why we have tenses at all. I will argue that our language is tensed because our experience is tensed, but we cannot infer from this that time itself is tensed. This last claim is the thrust of my thesis and will be set out throughout the chapters to follow, but I will lay the grounds for it here.

2.   The B Theory and The Use of Tenses

Here I will look at two explanations for our use of tenses. The Old B Theory of Time took tenses to be a semantic concept and attempted to show that a B-theorist can translate tensed language into tenseless language. This was taken to fail because the translation involved a loss of meaning. The New B Theory agrees that tenses are purely semantic, but attempts to explain them in tenseless ways without relying merely on translation. Zimmerman (2005) refers to some New B-theorists, such as Mellor (1998) as B-theorists who take tense seriously[111]. He calls these *serious-tenser* B-theorists. Compare these with the Old B-theorists such as Smart (1949) who did not take tense seriously.

I will look at the development of the New B Theory out of the failure of the Old. I will conclude that the New B Theory is an appropriate theory of temporal language. That is as strong a defence as we can make, I believe, without support for claims that time itself is B-time.

3.   The Old B Theory of Time

The Old B-theorist claims that when I say that 'the Battle of Hastings is past', the meaning of this statement can be satisfactorily translated into a tenseless token-reflexive statement that 'the Battle of Hastings occurred earlier than 'this' statement'[112]. This theory fails, however, there is a loss in translation; tensed and tenseless statements quantify over different things.

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[111] Zimmerman, 2005, p. 405.

[112] See Bertrand Russell (1915) for an example of this token-reflexive approach. Russell argued that any assertion that 'x' is 'present' simply means that 'x' is simultaneous to the assertion 'x^1', where 'x^1' is the assertion that ''x' is 'present''. The assertion that 'x' is 'past' simply means that 'x' is earlier than 'x^0', where 'x^0' is the assertion that ''x' is ''past''. Likewise for 'x' is future: 'x' is future

Suppose that I make the following tensed statement in 2007:

S^A: 'The Battle of Hastings occurred 941 years ago'.

This tensed A-statement can be translated into a tenseless B-statement:

S^B: 'The Battle of Hastings occurred 941 years before statement S^A'

On the token reflexive account A-statements can be translated into B-statements. This means that A-statements need not entail a tensed ontology.

Compare this with a second way to translate A-statements. Instead of using token reflexives, this account employs dates. We can translate A-statements into statements about events and dates, such that S^A can be translated into S^B*:

S^B*: 'The Battle of Hastings occurred 941 years earlier than 2007'

The advantage of this translation is that the truth-value of S^B* will always remain the same. If it is true, it will always be true. Compare this with S^A, which is true in 2007, but false in every other year.

The criticism of the Old B Theory is that such a translation involves a loss of meaning. If so, then attempts to translate A-statements like S^A into B-statements such as S^B fail. This applies both to the token reflexive and the date account. First I will show how this criticism applies to the token reflexive account.

Start with S^A: the A-theorist claims that S^A is a complex statement quantifying over five things (whether they be events, times, properties or people); the event (Battle of Hastings); the statement S^A; the temporal interval of 941 years and two properties of time; 'ago' in S^A refers to a property of pastness in the Battle, and a property of presentness in the statement. These notions of pastness and presentness may be construed in many different ways. Smith (1993, 2003) takes presentness to be a metaphysical and logical subject and pastness to be a percentage of existence – the present is 100% real; the Battle of Hastings is the 100% – 941 years of real existence. There are other ways to characterise this, but we need not fully set them out here. It is sufficient to see that A-theorists take S^A to quantify over events and three properties of times.

Now turn to S^B: S^B seems to quantify over only three things: the event, the temporal interval and the event of expressing S^A. There is no mention here of properties of pastness or presentness. If S^A and S^B quantify over different numbers and different types of things then the translation of A-statements into B-statements fails. It follows that if there is a loss in translation, we capture something in A-language not captured in B-language.

4.   *The New B Theory of Time*

The response to the problems of the Old B Theory is to argue that whilst A-language cannot be translated *into* B-language, A-language is *made true* by B-facts. Here tenses are taken seriously, in Zimmerman's language. S^A cannot be translated into S^B. but is made true by the tenseless fact that S^A is stated/believed in 2007. This is a viable theory and explains, I believe, our use of tenses without the ontological commitment of the A Theory.

This response takes on two forms, a metaphysical and a semantic form, which are often confused[113]. The metaphysical form goes as follows. A-statements, such as S^A are made true by facts that are best described using B-language[114]. Statement S^A is made true by the B-fact that S^A is tokened 941 years later than the Battle of

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if it is later than 'x^2' where 'x^2' is the assertion that ''x' is 'future''. See also Reichenbach (1947) pp. 284 – 287.

[113] I owe this distinction to Greg O'Hair.

[114] This is a form adopted by D. H. Mellor (1998).

Hastings[115]. This makes the B-fact a truth-maker for S^{A116}. Since this is a B-fact, employing 'later than', the metaphysics underlying our A-language is a B-metaphysics.

The semantic form denies that the semantics of A-statements entails a tensed ontology. Tense is a semantic notion, and we cannot infer from the semantics of tense that reality is tensed[117]. Tenses, being a phenomenon of language cannot be taken as facts about ontology[118].

Before developing the metaphysical form I should say something about a broader issue involved in such a distinction; it seems that A-theorists tend to assume that tensed semantics commits us to, or quantifies over in Quine's terms, a tensed ontology. However, we can distinguish between language which commits us to a specific ontology, whilst being insufficient to justify that ontology, and language which best explains our ontology. The semantic form as employed by Heather Dyke, quite correctly points out that the existences of tenses by itself is not sufficient to show that we *have* to be committed to a tensed ontology. Rather a tensed semantics just shows that our language employs tensed concepts. The argument for a tensed ontology underlying that language ought to come from science. However, the A-theorist tends to assume that a commitment to tensed language *forces* use to accept an A-ish ontology; tensed language *commits* us to tensed ontology. But on its own A-language does not commit us to A-time, as we will see.

What then of a tensed language that best explains our ontology? Well, it seems that this might have some ontological commitments. But these commitments are weak and rely upon secondary evidence. If time is A-ish, then we need the A Theory. We need an account to show that time *is* A-ish. If it is, then we *need* the A Theory to explain time. Notice here that the direction comes from ontology to language, not the other way round.

What is it for tensed language to be true? According to the correspondence theory of truth a statement is true if it corresponds with the facts[119]. How might we take this correspondence? I will focus on two responses to this question. First we could take correspondence to be a substantive relation between a statement and the fact about which that statement is made. My statement that 'it is now sunny' is made true by the sunny nature of today and by a relationship of that fact to my statement. If accepted than adopting a correspondence theory could justify an A or a B Theory.

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[115] D. H. Mellor (1998) distinguishes between tokens and types. Sentence 'S^A' is a sentence type; it is abstract and independent of experience. However, when any person makes statement 'S^A' in a speech or thought act, he uses a token of that statement.

[116] This is the approach adopted, for example, by Mellor (1998). Mellor takes temporal truth-makers to be B-facts. He also takes conjunctive, disjunctive or negative facts to be temporal truth-makers. What makes an A-statement true is the B-fact that it is employed at a particular B-time, given by a date.

[117] See Dyke (2003a, 2003b) for a clear statement of this position.

[118] It is not obvious that the semantic form takes tense seriously, since it only explains our use of tenses as a semantic tool. The metaphysical form, however, takes our use of tenses seriously and attempts to explain our use of them by moving beyond the semantics. The semantic form *could* do this, but at present it tends to merely try and *replace* tenses; and this does not treat tenses as something worthy of consideration. Zimmerman characterizes taking tense seriously as a recognition that certain temporal propositions are perspectival and so tenses cannot be eliminated from our talk of these. As such, here tenses are accepted as concepts in their own right and not merely dismissed through translation.

[119] I focus on the correspondence theory because it has a primae facie case for involving a mind-independent conception of truth-makers. By contrast, a coherence view could ignore reality, taking 'true' to mean cohere with other beliefs; there is no explicit role for reality here. Alternatively we could adopt the pragmatic approach. Whilst in its early form, as derived by Peirce, pragmatism was tied into explaining and prediction the world, in its later form, pragmatism reduced to the usefulness of adopting it.

My statement, if true, involves a fact and a substantive relation between that fact and the statement. This statement could be made in an A-ish way, as I have above, or translated into a B-ish version. If we could show that A-language is *necessary* then since that language is metaphysically connected to the ontology, the use of A-terms *does* commit us to A-time. If we can dispense with A-language and suffice with B-language then we are not committed to A-time. We *might* be committed instead to B-time.

Second we could take a deflationary approach to correspondence. That a statement corresponds with the facts does not force us to accept that there is a substantive, and metaphysical, relation between that fact and the statement. All we need to say is that for a statement to be true there must be a fact that makes it true. There is no requirement here for a metaphysically substantive relationship between the fact and the statement. If so, then we could agree with Dyke that use of A-language does not commit us to the A Theory; but nor does it commit us to the B Theory.

If we follow a deflationary approach and claim that correspondence could be weak and involve no ontological commitments then merely sorting out our semantics cannot sort out our ontology. This certainly supports the B-theorist over the A-theorist. The A-theorist tends to rely on the semantics, whereas a B-theorist, such as Dyke, may employ semantics to block this move, she also takes her cue from science. However, as we saw in Chapter 4 (and 5) there is no cue in science for time being B-ish. The most we can get is an account of the contents of time being B-ish.

Having looked briefly at the distinction between the semantic and metaphysical form here I turn to focus on the metaphysical form, which entails the semantic, in that if the facts of the world are B-facts, the A-theorist cannot infer A-facts from A-language alone. Smith and Priest think that the metaphysical form fails, but this is a mistake residing in their use of truth conditions, whereas Mellor employs truth-makers, B-facts.

Smith (1993) believes that the translatability problems of the Old B Theory apply to the truth conditions of the New B Theory: 'no A-sentence or A-sentence token has the same truth conditions as any B-sentence or B-sentence token' (Smith, 1993, p. 12). A-statements have A-truth conditions, truth conditions that can *only* be stated in A-language. The truth conditions of S^A are *tensed*; the Battle of Hastings *occurred* 941 years ago. Smith argues that A-sentences *require* A-truth conditions, which quantify over tensed States of Affairs. Smith concludes that since no B-truth condition involves presentness, whilst A-truth conditions do, no B-truth condition can be used to do full justice to the meaning of A-statements[120].

Priest (1986) thinks that Mellor-type arguments are symmetrical. The B-theorist can provide tenseless truth conditions for A-language, but the A-theorist can also provide tensed truth conditions for tenseless language. Priest's arguments are aimed squarely at the early Mellor (1981), but can also be seen to apply to the later Mellor. Priest thinks that Mellor's account against the A Theory fails because Mellor has silently assumed that truth is untensed[121]. What we need, Priest concludes, are independent reasons for thinking that facts are untensed.

But these criticisms do not really apply to Mellor's theory. Smith and Priest speak of truth conditions whilst Mellor talks of truth-makers. Priest claims, for example, that tense is unreal if we can use untensed sentences to express the truth

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[120] Note that if Smith's view has any value it shows that the semantic version of the New B Theory does not take tense seriously, since it tries to eliminate tense from the propositions underlying our language. Attempting to eliminate tenses suggests that we could live satisfactorily *without* them; we dismiss them as (possibly) irrelevant to our lives, notably our explanations of the universe.

[121] Priest, 1986, p. 166.

conditions. Here truth conditions are things expressed by language, and seem to be proposition like. Smith seems to concur; he thinks that truth conditions are proposition like. He characterises the New B Theory as follows; 'tokens of A-sentences are not translatable by B-sentences but that since B-sentences suffice to give the truth conditions of A-sentences or their tokens, it follows that A-sentences do not ascribe A-properties' (Smith, 1993, p. 11). Here truth conditions seem to play a semantic role.

But Mellor rejects the use of truth conditions; to give meanings, "truth conditions must include imaginary as well as actual conditions" (Mellor, 1998, p. 63). He thinks that little relevance to truth can be gained by having imaginary content. Truth conditions can be used to express the truth about statements, but Mellor prefers facts, which he construes as truth-makers. In his (2003) Mellor compares tensed and tenseless theorists, where tensed theorists tend to use a tensed meta-language to say when tensed statements are true; tenseless theorists symmetrically, use a tenseless meta-language to say when tensed statements are true. Both attack each other's meta-language. They are both right here. But this correctness is merely semantic. Mellor points out that both theorists cannot be 'right about what *makes* such sentences true, i.e. about whether time itself is tensed' (Mellor, 2003, p. 212, original emphasis). Both theorists are mistaken if they think that our semantics decides our ontology. Mellor rejects the use of 'truth conditions' because it tends to blur the distinction between semantics and ontology.

Mellor states his B Theory in terms of such truth-makers and thinks they are facts. The only facts available, Mellor believes, are B-facts, which do not entail A-facts, but do explain our A-language. Mellor believes that 'B-facts are contingent facts about how much earlier or later events are than each other, and hence about their B-times' (Mellor, 1998, p. 19). In his (2003), Mellor thinks only contingent propositions need truth-makers. Since contingent truths are about what is in the world, truth-makers are things in the world[122].

Mellor here is invoking the independent support Priest called for; Mellor is importing B-facts. B-facts are, if we follow Mellor, contingent facts about the universe. They are not truth conditions, but empirical entities open to our discovery. Mellor has some support for his claims when he calls on contingent facts as truth-makers. This is a good explanation for our use of tenses and I think it a reasonable view to adopt. Here Mellor has gone beyond the semantic issues of the Old B Theory and tied our language use to (contingent) facts about the world. But note that, as I showed in Chapter 5, B-facts cannot be about time itself: SR is not B-ish.

I have here set out the Old B Theory and shown that it fails to translate B-statements into A-statements because A- and B-statements quantify over different things. I then looked at the New B Theory to show that it is a viable position. This then shows how the B-theorist can deal with the first issue. The B-theorist can account for our use tenses without ontological commitment: tensed languages have tenseless truth-makers.

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[122] I have replied to Smith and Priest here using Mellor's metaphysical version of the New B Theory. The semantic version can also be used to rebut the claims. The semantic version of the New B Theory blocks the move from semantics to ontology. Dyke, for example argues that the New B Theory 'is intended to undermine the A-theorist's move from claims about the irreducibility of tensed language to the conclusion that reality must be tensed' (Dyke, 2003a, p. 381). The New B Theory does not itself infer a tenseless reality from tenseless semantics. 'Any inference that can be drawn between the semantic and ontological theses of the new B Theory of time goes *from* the ontology *to* the semantics' (Dyke, 2003a, p. 383, original emphasis). If so, then Smith and Priest's focus on truth conditions does not fully address the claims of the New B Theory.

13.   B Theory and Experience

I have shown that the New B Theory can satisfactorily account for our use of tenses. However, providing an account of the metaphysical basis of our semantics cannot explain why we have tenses in the first place.

I believe that our language is tensed because, as Price (1997) argues, we are creatures *in* time and subject to the same (contingent) forces as other entities. In Price's case this is the second law of thermodynamics. Maclaurin and Dyke (2002) talk of causation. It is not important which forces are *the* forces we are subjected to, but such claims are sufficient to show that our use of tenses reflects our perspective as creatures *in* time. If this is the case, then we need an account to explain our tensed experience. The A-theorist has an obvious case; our experience is tensed because it is an experience of a tensed world. Traditionally, the B Theory has seen to be an inadequate explanation for our experience of time. To motivate this I turn to the work of Arthur Prior.

14.   Thank Goodness That's Over

Prior asks why we thank goodness some pain is over, rather than thank goodness that some pain is not present. Suppose that I have a dentist appointment tomorrow, and that I had a dentist appointment one week ago. Today I am not at the dentist. I am glad that last weeks dental appointment is over. But tomorrow I am going to have a wisdom tooth out and know that this will be painful. If the New B Theory is true, then the above claims are made true by B-facts. As such, my attitude to last week's dental visit and tomorrow's visit should be the same. I am glad that I am not at the dentist on Monday 15th January 2007. I am glad that the dental visit I had on Monday 8th January is not occurring on 15th January. What then of my attitude to my visit to the dentist tomorrow? Is the level of happiness the same? Should I be glad that the pain is not occurring on 15th January? But my attitude to tomorrows visit is not one of gladness; I do not feel happy about tomorrow's visit at all. In fact, I fear it.

We fear future pain, and express relief once pain is over. A simple account of B-facts for A-language proves insufficient in the light of such a problem.

> One says, e.g. "Thank goodness that's over!" and not only is this, when said, quite clear without any date appended, but it says something which it is impossible that any use of a tenseless copula with a date should convey.
>
> (Prior, 1959, p. 17, original emphasis)

As Mellor notes, statements of the form 'thank goodness that's over' seem to be thanking an A-fact and not a B-fact, that pain is now over[123]. Consider a particularly nasty toothache that I suffer on 5th January 2007. My statement, on 6th January that 'thank goodness that toothache ended on 5th January' does not have the same force as 'thank goodness that toothache is over!' If we try to analyse a tensed copula in terms of a tenseless one some essential feature of our experience is lost. Even if A-statements are made true by B-facts, there is some loss of meaning in our move from an A-language to the B-language. When we 'thank goodness some pain is over' our semantics seem to quantify over concepts that can only be explained by the A Theory. It seems that these concepts are more than just linguistic concepts, they seem to have some ontological reading; the claim is that because we need tenses to thank goodness some pain is over that we should conclude that the 'over' refers to an ontological entity, i.e. the past.

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[123] Mellor, 1998, p. 40.

I will look at two attempts to resist this conclusion. These mirror the distinction between the metaphysical and semantic version of the New B Theory. The metaphysical form tries to account for our experience by grounding them in B-facts. Facts best described by the B theory are used as a basis upon which we build our tensed linguistic concepts. B-facts are the metaphysical basis for a tensed semantics and *fully* explain that semantics. This fails, because saying when an experience is true does not explain the experience itself. B-facts may explain how our experience can be truly described, but cannot explain the phenomenological experiences themselves. I fear future pain; B-facts only explain when such fear is justified (i.e. when it is true that I am about to visit the dentist). The semantic form attempts to explain that experience by restricting the scope of tenses to our concepts, whereby the tensed nature of our language cannot be used to infer a tensed ontology. These are an improvement but do not fully capture the A-ishness of our experience. If so, then the B Theory cannot fully explain our experience.

Mellor's (1998) metaphysical account is a generalisation of his truth-maker theory. What makes me grateful that some pain is over is that I believe it is over and this belief is held later than the pain. Symmetrically this applies to fear of future pain. I believe that some pain is future and hold this belief at a time earlier than the pain. Mellor provides an account of when beliefs about events can be true. But this is insufficient to explain the experience of fearing future pain and being relieved about past pain. A belief can be taken as a mental state, and a mental state of fear of the future seems to be more than a pure verbal belief. Saying that my fear of tomorrow's visit to the dentist is made true by the fact that the belief is held the day before that visit does not explain the fear; it merely shows that my fear is rational, i.e. not based on a non-existent dental appointment. The fear of future pain is not a matter of believing correctly that the pain is future. We fear the pain because we experience it as *being* future; our fear has non-verbal content. The claim here would then be that this non-verbal content is best explained as being ontological content; by time being A-ish.

Cockburn (1998) raises a different criticism. Cockburn argues that B-theorists tend to assume, as Mellor here assumes, that the fundamental and sole role played by A-facts is grounded in the idea that A-statements can be true or false. Cockburn believes that a role *as* fundamental to our use of tenses is a role of placing our emotions within some sort of temporal context. How we view an event has an emotional effect upon us, lost in tenseless accounts. Cockburn argues that we cannot assume that the fundamental and *sole* role of metaphysics is to determine what makes our language true; metaphysics has many other roles and ought not be restricted to providing truth-makers for our language. Metaphysics is about what is out there, not *solely* about what is out there that makes our language use correct. Tenses also play a role in developing an emotional response to events that are (in some uncertain way) past, present or future. If we are to explain our actions in relevant ways, e.g. why I believe that the Battle of Hastings is in the past, then a simple account of tenseless truth-makers is inadequate. Whether our employment of tensed A-language is correctly understood depends upon whether the States of Affairs that are said to make them true adequately explain the relevant feelings and reasons for action. It is not clear, Cockburn argues, if the new B Theory can do this. Explaining actions is not a matter of beliefs etc., being true or false. I think we should reject Mellor's account because it makes this assumption, but it also fails to capture the wealth of the experience of fearing future pain, and relief at pain being over.

A possible solution, moving beyond mere B-facts, is proposed by Maclaurin and Dyke (2002). They claim that we evolved to be relieved that some pains are past, and fear future pain. Creatures that did not fear future pain did not learn to

avoid them and got wiped out in the evolution of the species. A sense of relief is a way of learning that some pain, once experienced *ought* to be avoided in the future.

> [The] B-theorist can be satisfied that our dread at the prospect of future pain (and not past pain) has a good evolutionary explanation which does not rely upon there being tensed facts.
>
> <div align="right">(Maclaurin & Dyke, 2002, p. 285)</div>

Future pain has priority because we cannot affect past pain. This is because the direction of causation is predominantly from earlier to later. They believe that this account can be generalised into a full account of our tensed experience. If our experience is tensed because we evolved to see it as A-ish, then the B Theory can account for our A-ish experience.

As tempting as Maclaurin and Dyke's evolutionary theory is, I think it suffers two weaknesses that when combined are a significant flaw. They give an evolutionary account of fearing future pain and being relieved that some pain is past. They claim that these emotions are 'past directed' and 'future' directed[124]. This is A-language. Maclaurin and Dyke explain these in B-theoretic terms. Even so, there is a suspicion that these directed emotions are *directed*, but not by events. There is nothing in the current event, later than the earlier visit to the dentist that forces me to direct my emotions forwards. However, our fear is stronger than being 'directed' suggests. We have emotions about future and past events, beliefs about them and so on. The focus of my thoughts when thinking of my childhood is directed towards the past. When planning my retirement my thoughts are directed towards the future. Our fear of future pain and experience of the future is more than just being directed. The suspicion is that there is something over and above the event and the A-theorist has an explanation for that; it is the A-ish features of time. The B-theorist has not got this in his arsenal. Saying that we have past directed and future directed emotions entail that they are directed towards something; they are about things outside of us. If these emotions are *about* things, it may be that they are *about* time. What we need is an account that rules this out.

We could make distinctions here that prove problematic for Maclaurin and Dyke. Their talk of past/future directed could be taken in two ways:

1. The intentional object of a mental state, such as a thought or an emotion. I fear future 'pain', which is brought about by some event. The mental state is future directed here since its intentional object is *in* the future.
2. The ontological cause of that mental state; the event that brings about my mental state, or the 'point' of that mental state, i.e. the lessons we can draw from these mental states.

Fear of past pain is directed in sense (1). I may recall past visits to dentists and this may motivate a need to brush my teeth properly. This past directed fear has a future directed point, or lesson; it alters future behaviour. However, fear of tomorrows visit to the dentist may be directed in sense (1), but not obviously in sense (2). My visit may be a result of an accident, so no future directed alterations of behaviour would emerge from the fear. We might think that Maclaurin and Dyke should argue only for sense (1), since sense (2) could be taken to have ontological commitments; i.e. to a *future* in which I visit the dentist.

A further distinction could be made as a result of the above. The lesson, or point in (2) seems to be a specific, or token, directed point. I fear this particular dental visit. Maclaurin and Dyke seem to focus on a type-direction. We can distinguish between fear of the future that has a particular practical application; fear

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[124] Maclaurin & Dyke, 2002, p. 286.

of future dental visits motivates me to brush my teeth. This helps me survive etc.
But generic fear of the future appears to have no practical application.   I could have
a phobia about dentists, which prevents my attending and poor dental health hinders
my survival. Here Maclaurin and Dyke seem to need the practical fear which is
more closely aligned to (2), not (1). As such, their account could be seen to be a
little confused. They require a focus on intentional mental states, yet their
evolutionary explanation moves beyond that. The suspicion again is that this move
beyond intentional mental states takes us to ontology.

If our experience is tensed is time itself tensed? I will argue that no, our
experience is tensed because of a Kantian function of our epistemology; we impose
the A-ishness of our experiences onto those experiences and then infer that time is A-
ish. This claim needs careful setting out, so I will not develop it here, merely point
towards it as an initial response to the A-theorist claim that the failure of the B
Theory to account for our temporal experience entails the A Theory. It does not.

I have looked at the challenge set by Prior. We fear future pain and are glad
when pain is over. I rejected Mellor's solution but think Maclaurin and Dyke's
response reasonable, but I do not think it preferable to a C+A Theory, which builds a
mind-dependency thesis upon a C-ish ontology[125]. The evolutionary story they
develop leaves open the claim that our temporal emotions are *about* something,
which may be time.

15.   *Conclusion*

The arguments I have raised against the B Theory are not insurmountable. I
have raised concerns about the B Theory and a B-theorist can overcome them.
However, the attempts to date are unconvincing. Whilst the New B Theory is an
improvement on the Old B Theory, in that it invokes facts rather than semantic
notions, the support it assumes is not obviously provided by SR. The B Theory is
found wanting in one other area, it cannot fully explain our temporal experience.
What we do need is an account of our experience of time from the B Theory. I want
to suggest that a third option is available: a C+A Theory of time. Before turning to
this, in the next chapter I look at other attempts to develop a third approach to time.
Some of these approaches are done from within the framework of the B Theory;
some are not.

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[125] A C Theory based solely on the C series would suffer the same problems, and indeed perhaps be
worse off than Maclaurin and Dyke, and Mellor's.

Chapter 7
Beyond the A and B Theories of Time

1.   *Introduction*

Problems with the A and B Theories suggest that a third approach is required. The A Theory cannot escape McTaggart's Paradox, notably the 'vicious circle' argument. The B Theory assumes that time involves the distinctions earlier/later, when this needs to be argued for. I will argue that to get time itself we need to look to the C series. Before doing this I will set out some previous attempts at developing a third approach. This chapter is largely a historical survey. The approaches I look at serve as a background to a general push towards developing a complete theory of time that explains both time and our experience of time. I will first lay out the motivation for developing my preferred third approach: The C+A Theory.

2.   *The Need for a Third Theory of Time*

We have yet to develop a *single coherent* account of time. The A- and B-theories are incomplete, so we need to look for a different approach and one such approach is to return to McTaggart's C series. It may well be that a C series, involving simply isotropic relations of betweenness between events and objects in time, can provide the base on which we can generate a B Theory. If so then it can be the supporting structure for the B Theory. However, the isotropic nature of the C series distances us even further from our experience of time. To reconcile our understanding of time with our experience of time by adopting the C+A Theory, based on the C series, seems to move us even further from the A Theory. But this is not necessarily so. The C+A Theory explicitly requires a satisfactory account of our experience of time. It is only when we *combine* the C series ontology, with an A series psychology that we can explain time[126]. The C+A Theory holds that time itself is not temporal at all – not in any sense that is familiar to our experience. So how can we mistake the C series for the A series? I believe that Kant may suggest a solution.

3.   *Kant's Theory of Time*

Kant (1781) believed that the world is not temporal; 'Time is nothing but the form of inner sense, that is, of the intuition of ourselves and of our inner state' (Kant, 1781, p. 77). We understand and experience our inner state through our intuition of time. Time is, according to Kant, the *subjective* condition that makes experience possible; time comes before experience and is a priori. The world only becomes temporal after it has been acted upon by our mind/brain. Objective reality is not temporal at all, in any familiar sense. The mind/brain and our cognitive abilities are central to time.

Kant's thesis is too strong. Consider a man, born in a normal family who has grown up and now has a family of his own, a wife and a daughter. We can place this man in a temporal order with his mother and his daughter. The man existed *after* his mother and *before* his daughter and it is not obvious that he imposed such a temporal order.

Kant argues that experience acts as the spark of knowledge, even though it is not the sole source of our knowledge. Suppose I am the man. My knowledge of my mother is grounded in the fact that my mother exists. Kant thinks the appearance of my mother has been modified by my mind/brain. But my mother exists, otherwise

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[126] Note that this mirrors McTaggart's claim that we require the A and C series to generate the B series.

my knowledge of her is grounded in nothing, and we move from transcendental idealism to pure idealism. It is part of my knowledge of my mother that she gave birth to me. I also know that to give birth she must have reached a certain stage in physical development. This means that she *must* have been alive *before* she was able to give birth to me. Similar considerations apply to my daughter. It is only until a certain stage of physical development that I am able to produce offspring; my wife similarly has to develop the physical capacity to bear children. Suppose I do impose time. This entails that I also impose my mother, and my daughter. It is part of the identity of my mother that she was born *before* me[127]. If the concept of 'before' is one I impose, then it is hard to believe that my mother exists in any recognisable way. My belief that she exists *has* no grounding in an independent reality. Any object that appears to me in any form whatsoever must be imposed by my mind/brain. We have collapsed here into solipsism. Kant believes that all knowledge, to count *as* knowledge, is grounded in a mind-independent reality. But it is not clear how we *get* that independent reality in Kant's theory[128]. Kant was not justified in his claim that there is no ordering of events and objects in time in an objective reality. The most he can claim is that the mind/brain is central to our experience of time.

There are lessons we can take from Kant. Kant believed that since time is required to structure our experience it could not be part of that experience. Kant argued that objects conform to our understanding; our understanding does not conform to objects. If objects conform to our understanding, then the appearance of objects is brought about by our cognitive abilities, not intrinsic structures of the object itself. The structure provided by our cognition is time and space. If time structures our experience, it cannot be part of that experience. Think of this as a scaffold. A scaffold is used to provide the structure for the creation of a building. The scaffold itself cannot be part of that building otherwise we would require a further scaffold to provide that structural support. Within the confines of this analogy, Kant would argue that since we could not have a structure of the building without the scaffold, the building does not have that structure at all. We cannot know what shape the house has unless the scaffold is in place. If the shape of the house requires the scaffold then we can never know what shape the house is, independent of the scaffold.

The scaffold analogy captures Kant's thesis, but also shows that Kant ignored other possibilities, for example, that the scaffold itself relies upon the building it supports. The scaffold alone is insufficient: the scaffold cooperates with the building and the properties of the scaffold are independent of the building. If the scaffold cooperates with the building then we can know what the shape of the building is like, we just need to distinguish between the properties of the scaffold and the properties of the building. This suggests a possible explanation for our experience of time. We structure time in a cooperative way; properties of time and properties of our cognitive abilities cooperate to give us our experience of time. Because our cognitive abilities structure our experience, there is reason to suppose that our experiences of time are not like time itself. If this is the case, then the lesson we can take from Kant is that we need to distinguish the properties of time from the properties of our cognitive function that structures our experiences. I will turn to

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[127] I am using B-language because, in many ways, B-language is true of reality. This reality is an empirical and contingent truth, as I argued in chapter 5 so does not count as a structure of the universe, but only as empirical facts about the contents of the universe.

[128] Kant has a ready reply here, arguing that my mother and daughter are mere appearances, as my body is. But I was not born to an appearance, nor did I father an appearance. I was born to a person, and fathered a person.

develop this in greater detail in Part Two; here I just set it out as a move derived from Kant's theory of time.

4.   *Historical survey of Third Approaches*

I here provide a summary of some attempts at generating a third approach to time. The accounts I give will not be exhaustive; they point towards a recognised need for a theory that moves beyond any traditional split between an ontological approach (B Theory-like) and a psychological approach (A Theory-like). The purpose is to motivate a need for a systematic treatment in developing a third approach. I will start by looking at a continental tradition that has developed out of Kant, employing phenomenological methods to account for our A-ish experience. I then turn to attempts to bolster the B Theory.

Husserl (1893 – 1917 &1928) analysed the phenomenology of the time included within our experiences[129]. The flow of time is associated with our experience but this flow is not a feature of objective time at all, rather it is a purely subjective experience[130]. This flow of time reflects a flow of consciousness. Because of the intricate nature of our consciousness, we are aware of this flow. Moreover we can apprehend this flow *as a flow[131]*. Intentionality is central here. We are free to intentionally construct the 'flow' of time as an object, but only an object of our consciousness. We distinguish between the past, present and future. Such a distinction relies upon memory of the past, perception of the present and anticipation of the future. Time is a dimension involving memory of past events, perception of present events and anticipation of future events. If time involves memories and anticipations then we are free to posit the past and future as mind-dependent entities, rather than ontological realms of the universe.

Husserl focused largely on the phenomenology, when he should really have given us an account of the ontology of time. As such my approach will differ from Husserl's; I will provide an account of the ontology of time, and use phenomenology to generate evidence for an A-ish psychology of time.

Bergson adopted an epistemological approach. He focused on duration, which he took to be time at its most time-like[132]. In his (1889 & 1903) Bergson argues that duration is the psychic state that allows a multiplicity of successive cognitive states to cohere into a unity. Duration is the combination of the many and the one. There can only be the one duration, 'that in which our own consciousness habitually works' (Bergson, 1903, p. 49). Even though there is only the one duration we often picture ourselves in many different durations. In the end, though, Bergson believes that these always combine into one[133]. Duration is the state when our ego does not distinguish between the past and present[134].

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[129] In many ways Husserl's (1893-1917; *On the Phenomenology of the Consciousness of Internal Time*), and (1928; as *The Phenomenology of Internal Time Consciousness*), are interchangeable. The 1893 – 1917 are a collection of lectures translated by J. B. Brough. Husserl's 1928 is a later version of these lectures edited by Heidegger. They are similar treatments of Husserl's thoughts about our experience of time.

[130] Husserl, 1893-1917, p. 79.

[131] Husserl, 1893-1917, p. 88.

[132] Bergson's theory is spread out through many publications; his early work, which placed time as part of consciousness, is in his *Time and Free Will* (1889) and *Introduction to Metaphysics* (1903). He starts to move towards claiming that consciousness is an external entity in his *Matter and Memory* (1908). This was further elucidated in his *Creative Evolution* (1911).

[133] Bergson, 1903, p. 50.

[134] Bergson, 1889, p. 100.

Later Bergson adopted the view that duration is an ontological fact about reality. Duration is the flow of the past into the future where the past grows as it advances[135]. When we perceive duration, we do not *observe* it, we are embedded *in* it. We ordinarily distinguish between the object of perception and the act of perceiving that object. Bergson claims that there is no real distinction between the perception and the perceived[136]. He denies that the mind/brain imposes anything on the world. The duration that we experience is a real duration that filters through us.

But Bergson retreats from this position, arguing that we must return agency and memory to the body. The possibility of action is an internal entity, whilst perception is external. Take pain; we perceive some pain as being internal to us, e.g. a headache. We also perceive some pain as being (causally at least) external to us, and when in pain we act to remove the source. I put my hand in a fire; the pain is perceived as being caused by the fire so I remove my hand. I can only do this because I have internal agency.

He also thought that if our perception of an object exhausted our knowledge of it then we need an explanation for our memory of objects. Without an act of consciousness memories must themselves be observable as objects. Bergson admits that memory is not a perceptual function of the mind/brain, not some weakened present perception of a past item. If it were we might mistake the perception of a quiet tone for a weakened memory of a loud tone. Bergson constructs a third approach to time by mediating between his early views which took time to be part of our consciousness and his later view which took time to be an objective reality we are fully integrated with. Time as experienced is a meld of the psychological and the ontological. The C+A Theory will largely mirror this last claim, that time as experienced is a mixture of the ontology of time and the psychology. I will argue that several features of time have ontological and epistemological versions, e.g. duration.

Heidegger (1927) took time to be the boundaries within which we organise our lives[137]. These boundaries are set by the mind/brain. Time as it is ordinarily understood is an illusion. To find true time, we need to identify the source of that time. Original Time is, according to Heidegger, a field, a spread and not a series of successive and distinct *nows*. It is a four-dimensional view of time and objects in time; one that constructs the time that appears to us as a field starting at one time, our birth, and finishing at our death. Because original time is a field, it has boundaries, and should be considered to be finite. There is no privileged position within that field, only the position where we are at that particular moment. Heidegger argues that our experience of this field has three 'dimensions': roughly aligned with our notions of past, present and future. These dimensions become a way of seeing ourselves in time, not part of time itself. We project ourselves into the world and do so into one of these 'dimensions'. Our existence in the world involves either focusing on the present, preparing for the future or reflecting on the past. We add a temporal element to our existence. Time itself is the field, but the time with which we are more familiar is imposed by us. The *temporality* we associate with time is something that we impose on the world. We break time up into past, present *and*

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[135] Bergson, 1911, p. 5.

[136] Bergson, 1908, p. 218.

[137] Heidegger's theory is largely set out in *Being and Time* (1927) the first third of a supposed examination of existence, which he later abandoned as a self-contained project. The project continued in various other publications. An insight into the developments of his thought is contained in his prolegomena; *History of the Concept of Time* published posthumously in 1979. His inspiration from Kant is set out in *Kant and the Problem of Metaphysics* (1973). A useful discussion of the relationship between Heidegger and Husserl's thought is Dostal (1993).

future as a way of analysing our existence in terms of the boundaries of the ontology of time. The features that attract us to the A Theory are imposed by our mind/brain.

But we have reason to believe that some of this temporality is a feature of the world, albeit empirical (contingent) features. Heidegger's claim that we impose temporality, what I have been calling A-ishness, is problematic when it comes to direction. Whilst direction, I have argued, is no property of time itself, it does occur in the world, and Heidegger's thesis implies that it does not. This is where Heidegger and I diverge. Apart from direction, Heidegger's view is similar to my own in several ways.

Having looked at the continental tradition I will quickly survey some of the analytical approaches to time. McTaggart himself argues that when we *observe* time we do so as a time involving the A series *and* the B series. Even though time itself is not real, McTaggart thinks that we observe time. Le Poidevin (1998a) argues that such a stance means McTaggart owes us an error theory: if time is not real, why do we see it *as* real? McTaggart does provide an error theory: he claims that our perception of time would be the same whether time were real or unreal. It would still involve the A and B series. McTaggart believes we misperceive the universe as being temporal when it really is not. There exists in the world the C series, which we misperceive, through the A series as being the B series.

Grunbaum (1968) argues that the fact that we are aware of temporal becoming does not guarantee that becoming is a mind-independent physical force. This flow of time is mind-dependent because it 'is not an attribute of physical events per se but requires the occurrence of states of *conceptualised awareness*' (Grunbaum, 1968, p. 324, original emphasis). The time that we observe is, Grunbaum argues, similar to the colour that we see. Colours are mind-dependent because they require the existence of a mind/brain. Similarly the flow of time we observe is mind/brain dependent, for it requires the existence of a mind/brain.

Grunbaum fluctuates between two different theories, between a mind-dependent thesis and a mind-projection thesis. I will show that what we need is an account that incorporates both. I will argue that there are mind-dependent features of the universe that require a mind/brain projection onto that universe.

Smart (1980) also claims that the passage of time is an illusion. The passage of time is a reflection of the passage of information through our short-term memory. We are aware of the passage of information through our short-term memories and we 'confuse this with a flow of time itself' (Smart, 1980, p. 13)[138]. Smart's theory is too mind-dependent to give us an account of our experience of time as being A-time. Smart's theory allows us to dismiss the A Theory as mind-dependent. We need a theory that can also explain why the A Theory is so attractive.

I have briefly surveyed some approaches that attempted to develop a third approach to time. These serve to demonstrate that there is a need for such a third approach, one not explicitly generated within the McTaggart debate. I will argue that a systematic approach to time, explicitly dealing with the ontology of time and the psychology of our experience of time is the better approach to adopt[139].

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[138] I return to develop this suggestion in greater detail in Chapter 9.

[139] We can look to an analogy in the philosophy of language. We can either view expressions as associated with ideas, such as mental images, pictures etc., or as representations of the ontological objects they are about. Frege introduces the notion of sense to develop a third approach to understanding language: 'The *Beduetung* of a proper name is the object itself which we designate by using it; the idea which we have in that case is wholly subjective; in between lies the sense, which is indeed no longer subjective like the idea, but is yet not the object itself.' (Frege, 1892, p. 155, original emphasis). I believe that our treatment of time is analogous. The A-theorists rely too heavily on our experience, whilst the B-theorists rely too heavily on mind/brain-objectivity. A third approach can show how the two areas are linked.

5. *Conclusion*

The inadequacies of the A and B Theory motivate the need for a third approach to time. This move has its roots in Kant's theory. Such a move has been implicit in many of the approaches to time developed since Kant, but needs to be made explicit. There are two aspects of the C+A Theory that require attention. First, we need an account of time itself. The analysis in the next chapter will focus on the ontology involved in the C series. We need to develop an account of the contribution of the mind/brain; this will be done in Chapter 9. We need an account that analyses our knowledge of time, and how time is structured by our mind/brain. Before that, I look at the ontology of time and argue that it is best described by the C series. In Chapter 9 I will argue that the A-ish nature of our experience is imposed on our experience by our mind/brain, and thus an epistemological approach to our experience of time is required.

Chapter 8
Ontic Time

1. Introduction

To develop a third theory of time, a C+A Theory, we need to do two things: (1) develop an ontological account of time itself and (2) develop an account of the role of the mind/brain in our experience of time. Here I will address the first task, and set the second aside for the chapters to follow. In chapter 5 I rejected the B Theory because it is not a basic description of the universe. I argued that any theory should give us enough to meet the needs of science and no more, without a convincing argument. I will apply the same criterion here. If any ontological account of time is to be taken as a basic, then that theory ought not require further analysis. I believe that the ontology of time is best developed out of the C series, but there have been some attempts to develop an ontology compatible with the A and B Theories and science, so called minimal passage theories. I will look at these, and dismiss them. Before turning to this, we will need to get a better conception of 'understanding'.

2. Terminology and Understanding

To explain why our experience of time is so different to our understanding of time, we need to get a clear picture of 'understanding'[140]. Do we take 'understanding' to be a description of the clarity of our thoughts about some entity, or a function of our cognitive processes? There are two senses of 'understanding' being employed here. In one sense we are talking about our understanding *of* a particular concept. I understand that Euclidean space has three dimensions and is flat. This is our ordinary employment of understanding. There is a more technical use of understanding that will prove useful in the analysis to follow. In chapter 7 I spoke of the role of the mind/brain in structuring our experiences. The mind/brain has cognitive abilities, and it was through these, Kant argued, that time is imposed on experience. When I talk of this cognitive ability, I will call it 'UNDERSTANDING'. It is through UNDERSTANDING that our experiences are organised, or filtered in some way; UNDERSTANDING is a faculty of the mind/brain we refer to through epistemological analysis, a faculty *of* understanding, rather than an understanding *of* something else.

3. The Distinction Between The Epistemology of Time and the Ontology of Time

We can distinguish between the time included *in* our experience and the time within which these experiences occur. Foster (1982) argues that the fundamental distinction between times is between the time that 'features in the *content* of sense-experience and time as something in which sense-experience is *located*' (Foster,

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[140] Note that both the A and B-theorist claim to give an account of our understanding of time. I think the B-theorist has a better case here, but there is a sense whereby the A-theorist has a case for A-understanding. The A-theorist claims that to understand time is to understand time as being A-time. If, however we assume that our understanding of time be derived through scientific enquiry, then this A-understanding is under-supported by science. If so, then our understanding is not guided by scientific fact, but only by theory and this seems wrong; the A-understanding of time must radically alter our concept of what *it is* to understand. Also the 'vicious circle' argument of McTaggart's Paradox (where time is assumed to remove the contradictions of the A series) has yet to be resolved, and until this has been achieved then any A-understanding of time has that paradox at its heart. Unless given reasons to accept inconsistency, I prefer an understanding that is consistent. If not, we need an argument for the acceptance of inconsistency. At present the A Theory has not done this. I turn in chapter 18 to look at a possible inconsistent analysis.

1982, p. 254, original emphasis). This distinction reflects our experience *and* our understanding of time. We talk about the time that we experience; and we talk about the time within which we have experiences. Both forms of time are employed in some way in our talk of time. Only one potentially provides a true ontological picture of time itself: the other is an epistemological structure that modifies our interaction with time[141].

We need an appropriate terminology for this distinction, to ensure that when discussing one of these areas, we are not fooled into thinking we are talking about the other. I will adopt the terms 'Epistemic Time' and 'Ontic Time'[142]. 'Epistemic Time' refers to the time that is involved, or *featured within* our sense-experience. Epistemic Time is the temporal form of inner sense. 'Ontic Time' will refer to the time *within* which such sense-experiences occur. Ontic Time is something that can be known, just as objects such as rocks can be known. These terms refer to the two types of time that must be reconciled; 'Epistemic Time' refers to our experience of time, 'Ontic Time' to objective time, or 'time itself', the object of our understanding.

There are two senses of 'understand' here. The first has to do with a rational concept, one we can reason to a priori. This sense of 'understand' is central to the C series, for it is mostly through rational inquiry that we come to understand the C series. We reason backwards from our A-ish experience to a series that acts as a basic structure of the universe. The other sense has to do with our empirical understanding of an object; it is about dealing with and learning from objects and events as we experience them. This sense is about our knowledge of time. My talk of understanding from here on will not turn on this distinction, for Ontic Time, I argue is something we can reason to a priori, but is also something we can come to know through experience. We can come to know that the universe has a serial structure along the T axis, independent of any direction or passage of time. I will argue that our understanding of time should be guided by science, both as a theoretical and empirical enterprise.

Epistemic Time and Ontic Time are two distinct concepts: concepts that have separate and identifiable contents. These will allow us to distinguish between the properties of time itself, and the properties of the structure imposed by our UNDERSTANDING. I will focus in this chapter on Ontic Time, setting Epistemic Time aside for the next. Developing an account of Ontic Time will meet the first challenge for the third theory; providing an ontology of time. Before turning to this I will briefly look at the work of Bergson who made this distinction in a similar way, but drew opposite conclusions. His conclusions are wrong, but the fact that he made this distinction points towards an early recognition of the need for it.

4.   Two Types of Time in Bergson
Bergson (1889) distinguishes between the time of our science and the time of our experience, i.e. the time we understand and the time we experience. Scientific time, as represented through the mathematical equations of the physical sciences is

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[141] Of course the ontology of time still features in our epistemology, for it comes under the banner of what can be known. I term the ontology of time as something independent of the mind/brain, but knowable. The Epistemology of time here I use to indicate the cognitive abilities of the mind/brain, not to identify a philosophical area of analysis. As I will show in chapter 9, epistemology can be taken in two ways here: as a mind-dependent feature of objective time, or as a mind/brain function imposed upon our experiences of that objective time.

[142] The choice of 'Epistemic Time' rather than 'Psychological Time' is somewhat arbitrary. I prefer 'Epistemic' for two reasons; it refers to what we can know about time and how we know it, and to the structure of such knowledge, whether it is foundational, connectivist etc. 'Psychological Time' would be as appropriate, because it refers to something tied into the functioning of our mind/brain. The choice of terminology here being arbitrary has no affect on the theory itself.

an extended, homogenous dimension, likened to space. We break this dimension up into measurable units, e.g. minutes, hours and so on. The time we directly experience is one that flows in a definite direction and each moment melds into the others to form a heterogeneous process. This process (called duration) was, he believed, real time. The time of illusion is mathematical time.

Bergson conceives of two types of time, 'one free from all alloy, the other surreptitiously bringing in the idea of space' (Bergson, 1889, p. 100). Duration (duree) is a time that flows, it is a succession which refuses to separate its 'present state from its former state' (Bergson, 1889, p. 100). We could not distinguish between different times, since time is a continuum and resists separation. Our treatment of space is different; we can distinguish parts of space. The scientific view of time however introduces the ideas of space into time and distorts time.

> [We] project time into space, we express duration in terms of extensity, and succession thus takes the form of a continuous line or a chain, the parts of which touch without penetrating one another.
>
> (Bergson, 1889, p. 101)

But time is not a chain with parts that touch each other; it is a continuum. Bergson believes that only objects in space form discrete multiplicities. When we project time into a space-like dimension we create an artificial account of it.

Also, our experience of time is dynamic and this gets distorted by the scientific, spatial, interpretation.

> [Science] cannot deal with time and motion except on condition of first eliminating the essential and qualitative element – of time, duration, and of motion, mobility.
>
> (Bergson, 1889, p. 115)

The spatial interpretation of time removes the dynamic nature of our experience of time, and Bergson believes that this is a distortion, both of time and of ourselves[143].

Bergson makes two mistakes: he has his account back to front and he relies on internal reflection. First, Bergson believes we project the time we understand onto the time we experience, and that any attempt to reconcile the two fails because the scientific conception of time alters time. This goes the wrong way; in a conflict between our experience of a physical phenomenon and a science that describes that phenomena (and does so completely), it is science that we should take as our arbiter of what is physically real. Bergson has picked up on the discrepancy between a scientific representation of time and our experience of time. If that science can explain the phenomenon in question in a satisfactory way, which SR does, then we need more of a reason to reject that science than the claim that it conflicts with our experience.

Second, Bergson believes that delving deeper into our consciousness is a guide to the ontology of time, and this is a mistake. When faced with a problem of reconciling our experience of time with our understanding of time we ought not, I believe, rely solely on introspection[144].

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[143] An interesting distinction within Bergson to keep in mind is brought out by Grosz (2004). Grosz construes Bergson's distinction as one between differences in degree, or quantitative differences, and differences of nature, or qualitative differences. Differences of quantity can be measured, but qualitative differences cannot be measured or described in numerical terms. Space is measurable under this regime, but time is not. Objects etc., in space can be compared, repeated, placed in opposition to each other etc., but processes and sensations cannot. 'Sensation, consciousness, mind or life – all in some ways interchangeable terms in Bergson's oeuvre – transforms itself in quality rather than magnitude' (Grosz, 2004, p. 161).
[144] Peirce (1868) argued that relying on internal reflection as a guide to certain knowledge is incredibly weak. Making 'single individuals absolute judges of truth is most pernicious' (Peirce,

That Bergson has identified the need to distinguish between scientific time and our experience of time, what I am calling Epistemic Time, shows an early vindication of my approach. He drew opposite conclusions, arguing that Epistemic Time is the true time, Ontic Time, the illusion, but I have rejected these conclusions because we should rely on science, not experience in the way that Bergson does.

5.   *Ontic Time*

Having looked at Bergson I turn to begin developing Ontic Time. Ontic Time is the time described by our science; it is an ontological object and is open to empirical study. Epistemic Time can also be considered to be an ontological entity, for it is present in the mind/brain in some way, and minds/brains are real. The difference here is that Ontic Time has a mind-independent ontological status, whereas Epistemic Time's ontological status is mind-dependent. I will argue that our understanding of time has to focus on Ontic Time[145].

If time is an empirical object, then there should be a role for science in the derivation of Ontic Time. This move reflects a reliance upon science for our philosophical evidence. If a theory is to be *about* reality, then it ought to make as few assumptions as possible. Any assumptions made ought to be well supported by scientific evidence.

Without delving too far into the science we can generate the following evidence. Einstein's Special Theory of Relativity (SR) is a well-confirmed theory about the macro state of the universe. Quantum Mechanics (henceforth QM) is the best theory of the micro level. There are two conclusions relevant to the start of our enquiry derived from SR. First, there is no universe-wide line of simultaneity. Simultaneity only occurs at a local level. Secondly, that time is symmetrical. The universal laws of SR have no preferred temporal direction built into it[146]. Not only are the laws of the macro time symmetric; this symmetry is well supported by QM. According to some interpretations of QM, backward causation is possible (see, e.g. Price, 1997). If backward causation is just as likely as forward causation, then any direction inferred about time derived from an asymmetry in the contents of time is unwarranted.

I believe that the C series best suits the needs of science. Any theory of time that posits a universe-wide movement of time has to make at least one assumption that contradicts the scientific evidence. Any theory that posits a preferred direction of time also makes an assumption that is not supported by the time-symmetric laws of SR. These considerations apply to the A Theory *and* the B Theory. The B-theorist can say that there is evidence in support of direction: the B series is a feature of the universe, but that has to be argued for, not assumed, as B-theorists have tended to assume it. As such the B Theory is not the basic theory B-theorists think it its; it relies on a more basic theory. Both the A and B Theories beg further questions, we need an analytically basic beginning for our analysis of Ontic Time. Such a position is McTaggart's C series.

1868, p. 198). This leads to the development of a single line of reasoning, only as strong as its weakest link. The only guide to certain knowledge comes about, Peirce argues, as a result of adopting the scientific method and public debate.

[145] The B-theorists may wish to construct Ontic Time in terms of clocks and notions of before, during and after to describe the ontology of time. But such an account begs the question: does time have such a preferred direction? A-theorists may be keen to construct Ontic Time in terms of the A series, but McTaggart's Paradox prevents them from doing so.

[146] See chapter 4, pp. 49 – 52 for the simultaneity and symmetry claims.

Here I set out the C series as the basic building block of a C+A Theory of time. McTaggart took the C series to be a non-temporal ordering of events. Take four events, M, N, O, P. The C series has no direction: it is isotropic. The order of events *could* run either M-N-O-P or P-O-N-M. Recall from Chapter 2 that McTaggart drew an analogy between the C series and natural numbers[147]. Natural numbers form a series but have no preferred direction. One direction does appear more natural to us, however[148]; the natural numbers have a single end point (0) and it appears more natural to us to start here.

To develop the C series as a basis for a C Theory, I prefer to use integers. Like natural numbers integers are ordered but there is no single end point. Since there is no single end point we have no obvious position to begin or stop counting. McTaggart thinks that the positive integers have a more natural reading, but we are free to go one way (positive) or the other (negative). This is the analogy I will adopt for the C series. Events in the C series are ordered but there is no obvious start or end point. This assumes that the Big Bang does not work as a structure that imposes a more natural reading of the C series. Since we are talking about the C series, it is more neutral to assume that there is no starting point, since it is the series we are interested in, not the start of that series.

Return to our four events, M, N, O and P. Within the C series, and assuming the analogy with integers, we would not be able to determine which direction would be the more natural: from the P to the M, or from the M to the P. We would merely have four separate events. We could say that N and O are between M and P; that N is between M and O, and so on. In the absence of a natural start or end point, we could not say that the series 'naturally moves' from the M to the N, or from the P to the O.

The C series is really constituted by events being between other events (or so I will argue). As a series the C series does not read as a temporal series, in the more familiar way that the A and B series read as temporal series. McTaggart argued that to temporalise the C series we need the A series. Once we have combined the A and C series we can generate the B series; for the A series gives the C series a direction, turning it from isotropic to anisotropic. With the rejection of the A series, the B series gets rejected; McTaggart thinks that this leave us with the C series. We could think of this in terms of Reichenbach's (1956) distinction between temporal order and temporal direction. The C series could be seen as a time order, completely independent of temporal direction.

There are two types of theory we could build on the C series: a weak C+A Theory and a strong C+A Theory. According to the weak C+A Theory, both the C and the B series apply to Ontic Time, but we have to start with the anisotropy of the C series to generate the B series. According to the strong C+A Theory, the C Series is *all* there is to time and the B series, like the A series applies to Epistemic Time only[149]. I do not decide between these two readings here but return to them in chapter 15, where a more complete picture of the theory is available. At present it is sufficient to note this distinction.

How Ontic Time looks will depend on the construction derived. I will argue that Ontic Time is best described in terms of the C series, not the B series. In the next section I will show that Ontic Time looks just like a serial ordering of events with relations of between-ness. Combined with the fact that this serial ordering and

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[147] See pp. 13 – 14.
[148] McTaggart, 1908, p. 462.
[149] Note that we can use the C series to generate a B series without recourse to the A series. The B series exists as a description of the contents of time, as such there is no need for the A series.

between-ness relationship meets the minimum requirements of science, then we do not need anything more than the C series.

7. *The C Series and Natural Order*

We need to conceptually analyse the C series to show that it acts as the start of an ontological account of time. McTaggart draws the analogy between the C series and the natural numbers. The natural numbers are the non-negative integers that begin at 0 and move in the positive direction, i.e., {0, 1, 2, 3,…}. The natural numbers are infinite, but they are infinite in only the one direction. They start at 0. We read this series in a more natural way, starting from 0, not ending in 0, but there is no a priori reason for doing so. We can still end at 0, though then the problem becomes one of where do we start.

The natural numbers {0, 1, 2, 3,…} are anisotropic in the sense that there is no order-preserving one to one correspondence between {0, 1, 2, 3,…} and {…3, 2, 1, 0}. Is the C series similarly anisotropic? It seems not, since there is no obvious limit in the C series with a more natural reading[150]. The analogy with the natural numbers needs to be replaced by an analogy with the integers, {…-3, -2, -1, 0, 1, 2, 3,…}. Here there is a one to one correspondence between {…-3, -2, -1, 0, 1, 2, 3,…} and {…3, 2, 1, 0, -1, -2, -3,…}. The C series has no prima facie starting point, so we cannot argue that it has a more natural reading[151].

Recall from chapter 5 that Grunbaum (1973) thinks we can derive an anisotropic topology of time by stipulating coordinates and invoking the second law of thermodynamics. We build up a series through the relation of between-ness then construct two opposing senses. We assign higher coordinates to one sense and lower to the other. Once this is in place we can, Grunbaum believes, employ the second law of thermodynamics to build anisotropy into the fabric of time[152]. As we saw in chapter 5 Grunbaum's move here fails, it merely shows that direction *in* time exists. The second law fails because the direction of entropy increase is only more *probable*, whereby a reversal in direction is not necessarily ruled out; it is just highly unlikely. Grunbaum's attempt to define 'later than' on probabilistic lines may seem reasonable. The direction of entropy increase of 'a typical representative' of the majority of the universe gives us temporal symmetry. This is a reasonable solution and one we might accept, but note that Grunbaum has had to argue for his conclusion, not assume it. We still need a starting point for this argument and the appropriate candidate for that is, I argue, the C series.

Grunbaum has moved beyond an analysis of a series, to providing an explanation for why that series is anisotropic. The series itself cannot decide the issue. It may well be that this applies to the C series. If the analogy with the natural numbers is a good one then we *do* have an intrinsic case for the C series being anisotropic. The natural numbers are infinite in only the one direction. Starting at 0, the natural numbers are spread out along the non-negative positive direction {0, 1, 2, 3…}. If the C series is like *this* then we may have a starting point, which we can label as 'earlier'. The series *beginning* with 0 moves without end, and it does so in the one direction: towards larger numbers. So if the analogy is a good one then McTaggart is wrong to argue that the C series is isotropic; it is anisotropic.

If the C series is anisotropic then the B-theorist is free to replace the relation

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[150] By 'limit' I mean something that can act as a starting point, for example, the Big Bang.

[151] As I stated above, this assumes that the Big Bang does not provide a structure to impose a natural reading of the C series. We are discussing the C series and it is more neutral to assume that there is no starting point; it is the series we are interested in, not the start of that series.

[152] Note however, that if we have to build anisotropy into the universe, then this suggests that the basic structure of the universe is isotropic, and best described using the C series, *not* the A or B series.

of between-ness with the relations of 'earlier than' and 'later than'. An earlier event is located closer to the starting point. If we take 0 as the first moment in time, we say that an event is earlier if it is closer to 0 than the other event. It is a simple matter of accounting for the C series in this way to generate the B series, and without the aid of the A series. The B-theorist need only provide a brief account of the C series to support his position. Once completed he can acceptably employ notions of 'earlier than' and 'later than'. These notions replace those of between-ness, because the C series has become the B series. In such a theory, the between-ness relation needs replacing because there is one number, 0, that is not between other numbers. We can call this the Proto-B Theory.

Even though the Proto-B Theory of Time can be got out of the C series we still ought to reject it. The Proto-B Theory takes Ontic Time to be a serial ordering that has an order with a more natural reading. This natural reading would use the 0 in our example as the starting point. An ending point could similarly be used to generate a direction. Out of either reading we could then generate the B series. In the first case when we say that event M is 'earlier than' event N we mean that M is closer to our starting point than N. In the second, event M is 'earlier than' event N when it is further away from that starting point. Either natural reading will suffice to give us a way to map this anisotropy into a B series, generating the B Theory. If this works, Ontic Time looks exactly like the B series. It is a natural ordering of events moving from earlier to later. What is missing are the structures described by the A Theory.

Whilst this is an acceptable move I do not believe that it has a scientific basis. Earlier I argued we ought to make as few unsupported assumptions within our theory as possible. There is an assumption at the heart of the Proto-B Theory: that time has this starting point, and has it necessarily.

We might think that the Proto-B Theory can be established without a starting point. We start by taking two points, A and B, and stipulating that A is earlier than B. This stipulation could, following Grunbaum, be derived from the second law of thermodynamics. Or we could stipulate this order arbitrarily. We can then claim that the Proto-B Theory is true *of* time. I think these moves need to be resisted. First, employing the second law involves the move from the direction of events and objects *in* time to the direction *of* time and, as I argued in chapter 5, we have no reason to suppose this true. Second, stipulating a direction of time in any arbitrary way reduces the Proto-B Theory to a stipulation rather than description of time and this seems ad hoc. It is important to note that there is no information in the series itself that gives us a direction. To see this we can turn to science.

Science suggests we remain within the C series. Not only are the laws of nature time symmetrical, they do not require a starting point. All that they do require is that we can separate events along the T axis. We can do this with the C series alone. The C+A Theory does not assume that time has a beginning, nor does it assume time has a direction. Since neither of these moves is required by SR we have a reason to reject the Proto-B Theory. The Proto-B Theory gives us more than is required by science. Given that I take science as our guide for the investigation of Ontic Time, then it is more natural to remain with the C+A Theory[153].

I think we need to reject the analogy with natural numbers and integers at this point, for this analogy has tied us into too many problems. The analogy was good to give us a general idea. Instead I suggest we adopt D. C. Williams' (1951) analogy of events in time being spread out like a fence-post across a field.

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[153] This aligns us more with the Strong C+A Theory.

> Time "flows" only in the sense in which a line flows or a landscape "recedes into the west." That is, it is an ordered extension. And each of us proceeds through time only as a fence proceeds across a farm.
>
> <div align="right">(Williams, 1951, p. 461)</div>

I will develop Williams' analogy to give us an idea of the ontology of the C series. Imagine yourself in an immense landscape, with land spread out in all directions. Along this land is a fence, marking out a line, for the sake of description here, in a North and South direction. The fence is the familiar one with wooden posts spread out evenly and joined together by wooden planks. You can see no beginning and no end to the fence. You decide to follow this fence in a northerly direction. Any variations are not due to the fence, but the landscape the fence is spread out across. This is the C series ontology. It has no natural beginning or end; any variation is due to the contents of time, measured in terms of the C series, but not brought about *by* the C series. Just as the fence will measure the distance you have travelled should you follow it, the fence does not *force* you in the one direction, it just accounts for the distance you *have* moved.

This is the better analogy to adopt when describing the ontology of time. Time is spread out in space-time in much the same way that the fence is spread out along the landscape. Each fence post allows us to differentiate between events, such that we can say that one post, *this* post, is between two other posts. This is the C series, a serial ordering of events in space-time, with no preferred direction. I think this analogy gives us enough to do our science.

8.   *The Needs of Science*

For science to operate as it does only requires a serial ordering and the relationship of between-ness. If all that science requires is a between-ness relationship along the T axis, then we can survive with the C series alone. But this seems somewhat unsatisfactory. We are providing for science a relationship that is not temporal at all. All we are providing is a series of events. If these events are not temporal then what reason have we for supposing that they are spread out across the T axis and not some spatial axis (x, y or z). Why do we need a T axis at all?

That the T axis has a different signature to the spatial axes in the equations of Minkowski space-time suggests that there is a difference between time and space. As such those entities spread out along the T axis cannot be satisfactorily mapped onto any spatial axis. There is no reason, however, to assume that because these entities cannot be transformed in this way that their physical structure along their own dimension is so radically different. When objects and events are spread out along a spatial axis, we do not think of that spread having a preferred direction, nor a moving here. We do make such an assumption where time is concerned. This requires explaining and I will turn to do so in the next chapter.

I believe that the C series is the only series that acts as a basis for an ontology of time. It gives us enough to do our science and no more, it does not beg any further questions in the way that the B series does, nor does it posit properties etc., not supported by science in the way that the A series does. I now move from discussing a C series basis for Ontic Time and look at work being carried out to derive an ontology of time compatible with an A and B Theory of time. If these work, then the C+A Theory may be redundant since we have an explanation for our understanding and our experience of time. I will argue that these theories fail.

9.   *Ontic Time as an A/B Theory*

Recently a number of writers have proposed theories that build on common features of the A and B Theories to construct what I will call an A/B Theory. The motivations here seem to be that the A and B Theories, once properly understood, have common features, which yield something important about Ontic Time. This weakens the A Theory and strengthens the B Theory to yield the A/B Theory. There seem to be two types of A/B Theories; one focuses on minimal passage, the other on minimal presentness. 'Minimal passage' theories try and build a passage into Ontic Time, weak enough to satisfy the B-theorist but strong enough to satisfy the A-theorist. 'Minimal presentness' theories try and propose a property of presentness weak enough to satisfy the B-theorist and strong enough to satisfy the A-theorist. These attempts fail, or so I will argue.

I will look at three minimal passage theories and one minimal presentness theory. Maudlin (2002) argues that the structure of space-time is asymmetric by nature, but seems to mistake the direction of the contents of time for that asymmetry. Savitt (2002) believes that we do not need the B series to be dynamic; rather the dynamism is involved in what the B series pictures. This is merely the B Theory. Dorato (2003) construes becoming as a dynamic fact of the universe. I think Dorato makes three errors based on a confusion between the contents of time and time itself. I then turn to look at the minimal presentness theory developed by Zimmerman (2005). Zimmerman attempts to invoke a notion of presentness acceptable to A- and B-theorists. He fails because the notion of presentness he develops for the A-theorist and B-theorist are not equivalent so cannot play the same role.

Maudlin and Bare Passage

Maudlin (2002) argues that time passes, simpliciter. Change presupposes that there is a passage of time. He is careful to distinguish passage from flow. The flow of time is a metaphor that has led us astray. It is better to talk of the passage of time. Time is the intrinsic, asymmetric, structure of space-time; and it is asymmetric, independently of any contents, e.g. the thermodynamic asymmetry.

Maudlin distinguishes between three arguments raised against the dynamic theory of time: logical, scientific and epistemological. He confuses the last two, but we will come to that later. Maudlin first dismisses Smart's challenge: if time flows, then at what rate does it flow? Either at the trivial rate of one second per second, or against some second temporal dimension. Maudlin dismisses this as a pseudo-problem. He draws an analogy with exchange rates. Suppose the exchange rate between the Euro and the US dollar is 1 Euro per 50 cents. Maudlin does not think it meaningless to say that one US dollar can buy one US dollar. Analogously, he thinks it meaningful to say that time passes at a rate of one second per second. The passage of time is a measure of how much something changes per unit of time. In an hour's time, I will be one hour further away from my birth and one hour closer to my death. Maudlin thinks this shows that time does pass[154].

Maudlin seems to confuse the movement of time with the movement of the contents of time. If I travel 100 kilometres towards Melbourne from Adelaide, *I* am 100 kilometres closer to Melbourne; space is not. In an hour's time *I* will be an hour

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[154] Maudlin seems to develop a response made by Bigelow in his (1991), who similarly argues that time passes at the trivial rate of one second per second, but leaves the thought undeveloped, (see Bigelow, 1991 p. 4). Prior (1968), also argues that time *passing* at a rate of one second-per second is not as strange as is thought. This strangeness is akin to the oddness of saying that change changes. But Prior thinks changes do change: an example being acceleration. If we take movement to be change in position, then that change changes when it speeds up; when it accelerates. This sounds strange, but is only of superficial value.

further from my birth. This is a fact about my position in time, not time itself. We need some extra argument in favour of the passage of time.

Maudlin rejects the scientific claim that the laws of physics do not pick out a direction of time. Maudlin thinks the laws of physics *do* pick out a direction.

> The discovery that physical processes are not, in *any* sense, indifferent to the direction of time is important and well known: it is the discovery of the violation of so-called CP invariance, as observed in the decay of the neutral K meson. These decays are *not* invariant if one changes a right-handed for a left-handed spatial orientation (parity) and changes positive for negative charge (charge conjugation). According to the CPT theorem, any plausible quantum theory will be invariant under parity-plus-charge-conjugation-plus-time-reversal.
>
> (Maudlin, 2002, p. 245, original emphasis)

In other words, the decay of the K meson particle shows that time is asymmetric. I suspect that Maudlin is confusing contents with structure. That some particles prefer one direction in time to another is no proof that time itself has direction. Humans are born and then, after an initial period of growth, start to decay. Humans can be said to prefer one direction over another: a reverse direction in time. This is a fact about *humans* not about time itself.

Maudlin also dismisses a problem as epistemological when it is fact scientific. If the decay of the K meson is sufficient to prove that time is intrinsically asymmetrical, then there are not enough K meson particles around to demonstrate this. Maudlin dismisses this as an epistemological problem: we simply do not know about the 'k meson' so we do not know that time is asymmetrical. But time is *obviously and pervasively* asymmetrical. If the K meson particle is responsible for this, then it ought to be as pervasive and obvious as time itself. It turns out that the decay of a K meson particle occurs only once in every 7 billion decays. Only three decays have been recorded since 1960. Hardly proof of a universe-wide phenomenon[155]. This is not epistemological, this is ontological, and to conflate the two is a mistake.

Maudlin's theory has a number of flaws and should be rejected. He confuses a preferred direction of the contents *in* time for a direction *of* time. He also confuses an ontological problem for his theory for an epistemological problem, thus *dismissing it*, when that problem needs to be fully addressed.

Savitt's Common Ground Approach

Savitt (2002) argues that the dynamic theory of Broad and the static theory of Williams are compatible. Broad construed 'absolute becoming' as the ordered occurrence of events either simultaneously or successively. This, argues Savitt, is the same as Williams' claim that there is no more to the passage of time than events being simultaneous or successive with sets of other events.

> [T]here is no difference whatsoever between [Broad's] understanding of absolute becoming and Williams' true and literal becoming.
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> (Savitt, 2002, p. 160, original emphasis)

Savitt concludes that the becoming described by Broad and Williams is all that there is to the passage of time. If so, then we have a case for dynamism strong enough to

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[155] See Christov et. al. 2004 for details. Also see
http://www.scienceagogo.com/news/20040223194124data_trunc_sys.shtml; http://www.innovations-report.com/html/reports/physics_astronomy/report-24661.html; and
http://physicsweb.org/article/news/8/3/14; accessed 31 July 2004, for brief details.

explain why events are earlier/later than other events, but not so strong as to attract McTaggart's Paradox.

Savitt thinks the B series can accommodate dynamism. It is commonly thought that if coming into existence is *all there is* to the passage of time, then we have a static picture of reality, and the passage of time drops out of that picture. Savitt thinks that this is a confusion between a static representation and a representation of stasis[156]. We do not need a dynamic picture to give us a picture of dynamism. To explain the direction of time we do not look to the structure of time itself, but to the contents in time.

Savitt believes that all there is to the passage of time is the successive occurring of events, this is enough to give us an A Theory. He agrees with the B-theorist that there is no property of now-ness that passes along this line, but also agrees with the A-theorist that the world is dynamic. This dynamism is taken as analytically basic, '…one has to start somewhere, has to have some primitives' (Savitt, 2002, p. 164). This bare passage is supposed to be strong enough to satisfy the A-theorist, but weak enough to avoid the problems of the A series[157].

I suspect that Savitt's theory will not satisfy the A-theorist, for it is merely the claim that one event occurs before or after another and this is just a restatement of the B Theory[158]. Without the transient now that passes along events, the A-theorist cannot be satisfied. We experience time as passing, not just one event coming into existence and then another event coming into existence. The dynamism of our experience is not captured by Savitt's theory. If so, then the A-theorist is not satisfied.

Savitt relies on similarities between Broad and Williams' theories to develop a middle ground acceptable to both. However, merely exploiting similarities between the two theories is not enough to satisfy both. As species humans and chimpanzees are very similar, they have hands, are apes and so on, but we cannot say that humans and chimpanzees are the same. Similarity is not enough to show congruence. Taking Broad's notion of 'absolute becoming' and showing how it is similar to Williams' notion of true and literal passage does not prove that Broad and Williams thought time had the same nature. Broad still thought time had a dynamic nature; Williams denied this. Savitt thinks time does not have a dynamic nature, and this, for all his protests, marks him out as a B-theorist.

Dorato and Cosmic Time

Dorato (2003) posits becoming as compatible with SR and the A and B Theories. Dorato starts from the premiss that SR plays a central role in the relationship between time and our experience of time. He sets out three steps:

1. Becoming is an essential feature of time as we experience it.
2. Mind-independent becoming presupposes an ontological difference between the past, present and future.
3. The geometrical structure of SR is a necessary constraint on physical time.

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[156] Savitt, 2003, pp. 162 – 163.
[157] Savitt concedes that his attempt to develop this middle approach may satisfy neither the A- nor the B-theorist.
[158] Weslake (2005) argues along similar lines. Weslake argues that McTaggart's rejection of passage is under-appreciated by Minimal Passage theorists. Any satisfactory account of passage must involve a moving now. Weslake believes that the Block universe cannot be glossed with a minimum passage to any satisfactory level. The moves made here cannot give a satisfactory account of passage, since they do not involve a moving now; if they did, McTaggart's Paradox would apply.

Whilst (1) and (2) are seen as plausible, Dorato is suspicious of (3). (3) is taken to restrain the move from time as experienced to physical time; (3) has traditionally been held to show that we cannot allow for the ontological difference required by (2). Dorato thinks that the presence of gravitation and gravitational matter show that SR *is not* an accurate description of physical reality. Boi (2004) offers some support for Dorato's position here. Boi argues that in GR 'space-time becomes a dynamical variable curving in response to mass and energy, and dynamics then becomes an aspect of the geometrical structure of the world' (Boi, 2004, p. 454). If this is so, Dorato thinks that SR cannot be taken to be a constraint on physical time; we should move to General Relativity (GR) and within this theory, we can move from (1) to (2)[159].

Dorato argues that if we can relativise a primitive relationship of becoming to space-time points then we can develop a theory that is compatible with GR and one that does not require a choice between the A and B Theories. In other words, relativized becoming should be acceptable to both A- and B-theorists.

To bootstrap this claim to meet the requirements of (2), Dorato thinks that the SR requirement that there is no such difference between past, present and future is actually a localised phenomenon. The presence of matter and its actual distribution means that we *can* distinguish between those frames of reference that are at rest and those in motion. He accepts the work of Godel, Weyl and Eddington, who argue that those frames we ought to consider at rest are those that follow in their motion the standard motion of matter. By locating a theory of time in GR not SR, Dorato claims we can generate some ontological difference between the past, present and future.

Given this, we turn to (1) to get an idea of what becoming actually is. Dorato thinks a clear understanding of becoming can be based on the concepts of change and mind-independence. He construes becoming as 'the *successive occurrence* (coming into being) *of tenselessly conceived facts or events*' (Dorato, 2003, p. 256, original emphasis). Dorato believes that this conception gives us enough to accept becoming as an objective fact of the physical universe. For an event to come into being is just for it to take place. This is also a natural way of understanding change. From this Dorato claims that becoming is mind-independent iff events occur successively at their own proper time. Dorato thinks *successive occurrence* captures our notion of becoming and the passage of time.

Dorato thinks a standard token-reflexive account can deliver the passage of time.

> [If] we identify the lapse of time with the view …, that the 'present coincides with the existing'. By relativising this claim to a time *t*, we get that at *t* only events simultaneous with (present at) *t* exists, where 'existence' is here understood in a relational, tenseless sense, given by 'existence at a date/time'.
>
> (Dorato, 2003, p. 270)

Dorato believes that Godel provides a good argument for this being enough to move from (1) to (2). Godel argued that at any moment in time only a certain portion of the objective facts about the universe obtain. Dorato thinks this true, and that we now have a case for there being an ontological difference between the present, past and future. But I think this claim need not entail dynamism. It can be taken in either of two ways. First, only certain facts obtain because they are all, and only, the facts

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[159] Boi (2004, note 14, p. 481) thinks that Einstein's field equations mean that it is impossible that the universe be homogenous and isotropic. The universe will always be expanding and dynamic. Boi thinks that Einstein was so unhappy about this that he introduced his cosmological constant to rescue a static solution to the field equations.

that exist. This seems to be a presentist claim. Second, only certain facts obtain because only those facts are contemporaneous to the context required. Dorato needs the first sense but thinks the second, token reflexive sense, is involved. I will show later that Dorato's theory is not acceptable to the A-theorist.

Dorato thinks the token-reflexive notion of becoming dissolves much of the argument between the A and B Theories. Becoming is mind-independent, which contradicts the B-theorist. A relativized occurrence of an event together with a relational factor of simultaneity gives us a minimal notion of what it is for time to pass, once SR is rejected as a constraint on physical time in favour of GR.

There are a number of reasons to reject Dorato's theory. I will focus on four. First he confuses the contents of time for time itself; second, his employment of GR to allow the move from (1) to (2) *is* blocked by SR so (3) still holds; third, attempts to use the expansion of the universe do not explain tensed experience to a satisfactory level; fourth, Dorato's notion of becoming is only the start of an A Theory so cannot unite the A and B Theories.

First, Dorato claims that a frame of reference can be taken to be at as near absolute rest as possible iff it follows the same motion as the majority of matter. This is a confusion between the contents of time and the structure of time. That the majority of matter is following a certain trajectory is no proof that anything following that trajectory represents a universe-wide wave of becoming. It merely shows that matter and the contents of space-time follow a particular pattern. If this is a description of the contents of time then it only applies to the contents – not to time itself.

Dorato might respond that he relies on GR, not SR, but this brings us to the second problem. GR describes the effect of matter on the structure of space-time to bring about the effect we call gravity. Gravity is a meld between the structure of the universe and the contents of that universe[160]. If this is so, then yes, GR is a good description of the macro-sized contents of space-time, but it should not be taken as a guide to the structure of space-time: that role is played by SR. GR describes the distortion to the universe brought about by the presence of matter. This is a distortion, and I think a distortion to the structure of space-time. So when Boi argues that GR is dynamic, he, as Dorato, confuses the contents of time for time itself. This means that SR *does* after all play a blocking role in the move from (1) to (2).

Even were we to reject this line of argument a third problem is brought out by Bourne (2004), who thinks that attempts to use GR to build a tensed theory overstate their case. Dorato thinks that we can use the motion of the majority of matter to determine which frames are at rest, and thus distinguish between the past and the future. Bourne thinks that the definitions of simultaneity required to do this are problematic. Cosmic time is statistical and depends on how far we cast our net for the generation of the average. Our definition of simultaneity, if Bourne is correct, comes out as a statistical convention, when what Dorato needs is a physical determinant. Dorato might respond that the expansion of the universe gives us that physical determinant. Boi certainly thinks that this expansion entails that the background geometry of the universe is dynamic. He does not say what he means by dynamic, though I think his interpretation suggests a view of dynamism based on gravitation. If so, then the dynamism involved is not the dynamism preferred by the

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[160] See chapter 5, fn 100, p. 73 – 74. I show that GR melds the contents of time with time (as described by SR) itself. GR shows that we often confuse the contents of time for time itself, in the way that we mistake gravity as a property of the universe when it really is a relationship between mass/energy and space-time.

A-theorist, for it just deals with the movement of matter etc., not the movement of time[161].

Bourne also thinks that the use of GR does not give the tensed theorist everything. All it does is give an account of the flow we associate with time (built into the expansion of the universe). GR does not give us ideas about the open future, fixed past, nor what it is to exist in the present. Bourne thinks that the expansion of the universe has nothing to say about these things. GR then is only a starting point for the tensed view, and more work needs to be done.

Fourth, Dorato constructs becoming as events merely occurring in their own absolute time. Whilst this is compatible with the B Theory and the A Theory, it is not compatible with the *whole* of the A Theory. Dorato invokes an ontological difference between the past and the present and the future, but this is blocked by SR, so the simple claim that becoming is an event coming into existence is not enough to give us an A Theory. It is a good start, but that is all it is. His notion of becoming is not a common ground between the A- and B-Theories; it just is a B Theory.

Zimmerman's Linguistic Turn

Zimmerman (2005) believes that a minimal property thesis can dissolve the dispute between A-theorists who believe that presentness is a privileged property of events, and B-theorists who believe that all times are equally real. This is aimed at the A-theorists who also believe that all times exist, but only the present has this privileged property, e.g. Smith (1993)[162]. Zimmerman thinks that B-theorists who believe that we cannot eliminate tense from our language, have motivation for positing a primitive notion of presentness, but deny that it is metaphysically privileged in the way that the A-theorist claims. These are B-theorists who take tense seriously. Whilst interesting, Zimmerman's attempt fails, because the primitive property cannot work in both A-ish and B-ish ways.

Zimmerman starts by claiming that each moment has a unique primitive property of presentness where time T is present and no other time has that property. This sounds A-ish, but Zimmerman believes we can generate a B-theorist version of it. He believes that a good B-theorist candidate for such a property is simultaneity.

> '*Being simultaneous with*, a relation that can hold between an
> event and another event or an event and a time' may well be
> regarded by the B-theorist as a primitive relation.
> (Zimmerman, 2005, p. 451, original emphasis).

Ignoring the relation between time and events, Zimmerman believes that there is only one primitive relation between times; 'this primitive relation holds between a time and only one other time, namely itself' (Zimmerman, 2005, p. 451). This makes self-simultaneity unique, such that time T, *and time T only*, has the property being self-simultaneous with time T. This is a primitive unique property that Zimmerman believes can dissolve the dispute between the eternalist A-theorist and the B-theorist serious about tenses. Self-simultaneity is a B-theorist version of the A-theorists' presentness. Call this B-theorist notion of presentness presentness*[163].

One problem is that presentness is a monadic property, in that it is intrinsic to the present moment, whereas presentness* is a relational property between two

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[161] Note that if Boi's dynamism is focused on gravitation, then the second criticism stands; Boi confuses content for structure, even though he explicitly takes that dynamism to be the structure. Boi takes the gravitational potential in the equations of GR to be a dynamic variable; space-time geometry *is* GR geometry. But this is not the dynamism required by the A-theorist, since it deals just with the movement of matter etc., not the movement of time.

[162] Zimmerman calls such a position an eternalist A Theory.

[163] The terminology is mine, not Zimmerman's.

times, which just happen to be in this case a time and itself. To resolve this problem Zimmerman draws an analogy with *identity*. In addition to a dyadic relation of identity, there is a primitive monadic property of *self-identity*. Analogously, in addition to a dyadic relation between a thing and time, there is a primitive monadic property of time itself, being *self*-simultaneous, i.e. presentness*. If the B-theorist is willing to posit presentness* then 'the A-theorist will be hard-pressed to deny that it is equivalent to her property of presentness' (Zimmerman, 2005, p. 451).

Zimmerman attempts to dissolve the dispute between the eternalist A-theorist and the *serious-tenser* B-theorist. It is not obvious that the eternalist A-theorist should accept that presentness*is equivalent to presentness. There are two reasons for this. First, it is not obvious that presentness* acts in the same way as presentness, second, it is not obvious, on Zimmerman's account, that presentness* is the same type of property as presentness.

First, if all times are self-simultaneous then this does not seem to indicate a privileged position, and the A-theorist can exploit *this* difference between his property of presentness and Zimmerman's presentness*[164]. The A-theorist's present is unique, no other time has it, whilst Zimmerman's presentness* is not unique in this sense. Each individual, to follow Zimmerman's analogy, is self-identical, but this does not distinguish between one individual and a privileged individual. Presentness serves to identify a privileged moment; all times have it, but only one time has it *now*. Whereas all times may be self-simultaneous, but there is no time that is self-simultaneous, whilst others *are not* self-simultaneous. It is not obvious that self-simultaneity or presentness* acts in the same way as presentness.

Second, having failed to convince that presentness* acts in the same way as presentness, Zimmerman fails to deal with the A-theorist response that presentness is monadic, and presentness* is relational. Zimmerman draws an analogy with identity, but this is not helpful, since he fails to show why self-identity is monadic. 'A. J. Turner is identical to X' invokes a relation between one individual and another, even if X is A. J. Turner. Invoking a relationship seems to imply that there are two things to relate. It is not obvious that self-identity is monadic. If self-identity is not monadic, Zimmerman cannot use the analogy to motivate his claim that self-simultaneity is monadic. Self-simultaneity invokes a relationship, such that 'time T is simultaneous to time T*' is dyadic, even when T is T*. As a result Zimmerman's response that self-simultaneity *is* a monadic property comes across as a mere assertion at best.

We have two reasons to reject Zimmerman's claim that presentness* is equivalent to presentness. If so then we cannot use mere similarity to dissolve the dispute between eternalist A-theorists and the serious-tenser B-theorist.

10.   *Rejection of A/B Theories*
I have looked at three 'minimal passage' theories positing becoming as a feature of the universe weak enough to give us the static requirements of the B Theory whilst dynamic enough to satisfy the A Theory. I also looked at a 'minimal presentness' theory. These attempts fail. Maudlin dismisses an ontological problem for his theory, when that problem needs to be fully addressed. He also confuses facts about the preferred direction of the contents *in* time for a direction *of* time. Savitt trades on particular similarities between Broad and Williams to claim that the notions of earlier than, simultaneous to and later than, generate a passage of time. This notion of passage is not A-ish enough to satisfy the A-theorist and just is a

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[164] Smith (2002) for example is an eternalist who believes that all times exist. But Smith believes that this existence is a matter of degrees. Only the present is fully real. Yesterday exists, but only to a degree (full existence minus 24 hours for example). Here all times exist, but only one time is present.

restatement of the B Theory. Dorato claims that we can move from claims about our experience to claims about time because SR does not play a restricting role; we should turn to GR. I have argued that GR is a good theory that describes the contents of time, but as far as the structure of time is concerned, SR still plays a dominating role. It follows that SR *does* block the move from our experience of time to time itself. Zimmerman attempts to generate a B-theoretic presentness* which plays the same role as an A-theoretic presentness. His notion of presentness* however is not equivalent to the A-theorist's presentness, so cannot dissolve the dispute in the way that Zimmerman wants.

Given these considerations I think we ought to reject the claims that time itself has a minimal passage. This means we are left with an ontology of time based in the C series. The problem with this is that it has even less of a chance of explaining our experience of time than the B series. We need to develop an account to explain this. I start this task in the next chapter.

11.   *Conclusion*

The motivation behind this chapter was to develop an account of Ontic Time; this account had to meet the needs of science and beg as few questions as possible. I have argued that an account of Ontic Time can be developed out of McTaggart's C series. Whilst we can develop a modified B Theory, invoking an initial C series analysis to remove the circularity, such a move makes more initial assumptions and Ockham's Razor suggests that we prefer the C+A Theory. We have a second reason for preferring the C+A Theory. If our ontology of time is to be taken as a description of time at its most basic, then we ought not adopt a theory that itself requires further analysis. The C+A Theory has no ontological component that has been derived from a less basic element. As such I suggest the C series be adopted as our picture of Ontic Time. This leaves us with the problem of explaining our experience of time.

My first task is complete; the explanation of the time we understand, scientifically and rationally. I now turn to the second task set the third approach to time: the analysis of the contribution of the mind/brain. Such an analysis will take up several of the following chapters. I differentiated here between Ontic Time and Epistemic Time. In the following chapter I develop an account of Epistemic Time. I will conclude that Epistemic Time involves the interaction between events and objects in Ontic Time and a conscious Being. Epistemic Time is analogous to secondary qualities such as colour. In the chapters to follow that I analyse our experience of time to derive the features of Epistemic Time that contribute to the difference between those experiences of time and our understanding of time itself, as described by Ontic Time.

1. *Introduction*

To develop a third theory of time I identified two tasks: to account for the ontology of time and to account for the experience of time. In chapter 8 I provided an account of Ontic Time based on McTaggart's C series. The ontological account of time that I have developed is significantly different to our experience of time. The second requirement was to explain our experience of time. This will be the task of not only this chapter, but of Part Two. Explaining our experience of time is the major task of my thesis.

Here I intend to set out what I mean by Epistemic Time; first by drawing an analogy with the perception of secondary qualities, then by conceptually analysing what I take mind-dependence to be. Before turning to these we need to set two criteria to be met if Epistemic Time is to be a satisfactory account of the role of the mind/brain in our experience of time.

First Epistemic Time must be A-ish enough to explain our temporal experience, i.e. explain why we experience time as *being* A-ish even though we think it is not. Second, Epistemic Time must not be so A-ish that either it conflicts with science or reintroduce McTaggart's Paradox to the world. We need an account of the mind-dependence of Epistemic Time that is compatible with science, that pays adequate weight to our experience, and that does not unnecessarily posit contradictions. If it is too A-ish there is also the danger that it would be incompatible with physicalism. This is not to claim that physicalism is true; but it is desirable that the theory we adopt does not commit us either to dualism or physicalism: the theory should be neutral as to whether physicalism or dualism is true.

I will conclude that Epistemic Time structures our experience in much the same way that our perceptual system structures our experience. Epistemic Time is mind-dependent, but interacts with features of the universe. I set aside any attempts to explain how this interaction works for Part Three. Here I am only interested in clarifying the way we can best understand what I mean by Epistemic Time.

2. *Epistemic Time₁ and Epistemic Time₂*

There are two ways that we can think of Epistemic Time: as being the system that allows us to experience time, or as being mind-dependent features of time. We can formalise these two concepts as follows:

Epistemic Time$_1$ (ET$_1$):   A system of the mind/brain that allows us to experience time.
Epistemic Time$_2$ (ET$_2$):   The mind-dependent features of time.

I intend in the first part of this chapter to develop an analogy with our perception of space and colour to account for ET$_1$. I then turn to set out what we should take ET$_2$ to mean; i.e. what we mean by mind-dependence.

3. *Perception, Space, Time and Colour*

An analogy with the perception of space will begin the conceptual analysis of Epistemic Time: specifically ET$_1$. The analogy will be imperfect in some ways and I will set out these imperfections, relating specifically to the thought that we do not perceive time at all. I then turn to look at problems central to perception. We perceive the world in ways that conflict with the scientific accounts; we see colour, when science suggests that colours are mind-dependent. I will suggest that our 'perception' of time is like our 'perception' of colour.

When we look at a city, Adelaide for example, we see several things. We see

spatial arrangements. A building is between two others; closer than others, is behind trees and roads and so on. We perceive a spatial field and spatial relations within that field. We also perceive other qualities. The building is in sunlight so is brighter than those in shade; it has a particular shape and colour. The trees themselves are coloured; some are green, some are brownish and red.

We perceive spaces, colours shapes and so on. We also employ concepts developed through perception in our reasoning. We can navigate familiar cities; know that to reach shop A, we need to walk North up one street, turn left at shop B and so on. We have a mental map of the city and use that to guide our travel through the city. We do not *see* the map nor the spatial arrangements represented by that map. We operate at a conceptual level in space in a way which is reliant in some way on our perceptual experiences[165].

We perceive space in a complex and multilayered way. We have access to space in the form of perspective, shape, spatial arrangements etc., in a direct way: we *look* at shapes etc. We also have a more conceptual access to space. We navigate through spatial maps without actually *seeing* them. Our perceptual system provides us with a visual field, one which we can exploit at a conceptual level. This is the analogy for ET_1.

ET_1 provides us with a 'temporal field'. A visual field involves everything we see, but a 'temporal field' is much harder to define. To motivate a concept of a 'temporal field' the example of perceiving Adelaide will need to be replaced with a more appropriate one, involving time, such as an event. Imagine that you are in a street and watch a red car drive along it. Music is playing on that car's radio, and you recognise the tune. This is our event, and assume for the moment that ET_1 gives us access to it.

We can analyse some of the features of the 'perception' of this event to see what ET_1 gives us access to. First, we see the car move. The car is in one place at one time, then another place at a different time. But we do not really *see* the time involved with the movement from one place to another. What we do is see one position of the car, then see the next, the next and so on. Perhaps then we just see a single moment in time, then the next moment and infer the movement. Here the only thing we 'see' is the one moment in time. Perception only gives us direct access to the *now*, or Present Moment. Concerns arise here that we may in fact only 'see' the car, not the Present Moment. I will return to this below, but first we should see that closer analysis of the event shows that were this description correct, we 'see' more than one moment; we see the car at one position *then* at another. We 'see' moments succeed other moments; we 'see' succession. We also see the car, and whilst it's position changes, the car itself endures, as does the street itself. So in a sense we 'see' duration. We also 'see' the car as being at one position *before* another. We also see a direction, not only of the car, but of the event; the car moves from the past into the future.

Our perception of Adelaide was a multilayered experience, involving direct access and conceptual employment of space. In the car example, we do not seem to have direct access to time in the way that we have direct access to space. We see the car, hear the tune, and *experience* the time. We could say that the time is inferred from our experiences. Here is a major disanalogy between the perception of space and 'perception' of time. Our 'perception' of time seems more like our conceptual analysis of space than our perception of space.

But this rests on a naïve view of perception; that it gives us immediate access

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[165] I use 'conceptual' in a loose sense here and do not wish to decide between theories of perception that claim that all perception involves concepts, and those that argue for non-conceptual content. I merely want to say here that we use concepts that include, in some way, space.

to the world. Such an assumption is problematic. Before turning to look at this, we need to look briefly at what the perceptual system does; it delivers perceptual experiences. Perceptual experience represents the world in some way; Adelaide is represented to us through perception. Representational theories tend to posit subjective representations, whether they be sense-data, qualia or sensations, which represent the world. Intentional theories tend to posit mental states *in* which we are aware of the world. Representational states are states *by* which we know the world; are states *through* which we know the world[166]. This sort of distinction is not as clean as I portray it here. Robinson (1994) for example distinguishes between intentional-representational theories, where sense-data are *about* their objects in the intentional sense, and non-intentional-representational theories, where sense-data only contain phenomenal qualities, and are not *about* anything at all.

There are two problems facing representational/intentional theories; first, what distinguishes perceptual beliefs from other beliefs; second; how is it possible to have those beliefs in the first place. The second problem is central to the issue here. First a few comments about the distinguishing features of perceptual mental states.

We have many different types of mental states[167]: sensations, perceptions, desires, hopes, beliefs and other propositional attitudes. Perceptions and sensations, we think are different in some significant way; they have phenomenal qualities missing in other mental states. Lowe (2000) thinks it natural to assume that perceptions are in some sense more basic than thoughts and beliefs. Many of our beliefs are based on perceptions but, except for delusions, perceptions are not based on beliefs. But this view tends to assume that perception is not cognitive, and Lowe thinks that perceptions qualify as cognitive because they possess conceptual content. I think this leads to the second problem, but first some mention of ways to distinguish perception from other mental states.

How might we differentiate between perceptual/sensory states and other mental states? Sense-data theorists take perceptual beliefs to involve sense-data. This distinguishes perceptual mental states from others, such as believing that cars have engines. The belief that cars have engines does not (directly) involve sense-data but my perception of the car does directly involve sense-data. Intentional theorists could differentiate perceptions by taking them to focus on the external world; but then how are thoughts about engines not directed at the external world? One available response is that perceptual states, being directed at the world, are in some way transparent; we see *through* them to the world. Intentional thoughts are, in contrast, thoughts involving propositions as objects; we do not *see* through them, but *think* through them. Here intentional thoughts are more abstract, having propositions as their intentional objects. Searle (1994) suggests one way to think of the difference between intending the world and intending propositions is that perception involves phenomenal, conscious immediacy, not characteristics of beliefs or desires; we could, in a sense, be said to have beliefs and desires when asleep, but we can only

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[166] We could say that we are aware of the world *through* representations of the world, e.g. sense-data. However, we are not strictly aware of the world here, we are aware of the sense-data and infer the existence of the world from that. To know the temperature in the room we look at a thermometer; we know the temperature in the room by looking at the thermometer. The thermometer only acts as a sign for the temperature; sense-data and other representations act as signs for their objects. Intentional states, by contrast are *about* the world, and suggest an immediate contact with it. Fodor (1988), for example, attempts to naturalize intentionality by tying it into causation.

[167] We could attribute mental states to the mind, or to the brain. Use of mental may imply a preference for the mind, suggesting an immaterial entity, but such use is compatible with physicalism. We could, if we attributed mental states to the brain remove our use of 'mental' in favour of neurological/neural. I use mental here in an ordinary sense and do not wish that use to imply a preference for a mind interpretation over a brain interpretation.

have visual experiences when awake. But this leaves us with the problem of dreams. We have dreams which cannot be said to be about the world, yet they have phenomenal immediacy. Searle could respond here that the key issue is conscious and causal immediacy. What counts as perception is that I see a red car and that there *be* a red car in my field of vision. This is lacking in dreams.

Armstrong (1961, 1968) denies that there is a difference in type between perception and other beliefs; perception just is the acquisition of beliefs. The perceptual system is a biological system to 'give the organism information about the current state of its own body and its physical environment' (Armstrong, 1968, p. 209). I do not intend to solve such issues, just raise them as general concerns to show that perception of space etc., may be as problematic as the 'perception' of time.

Lowe thinks perception counts as cognitive because it involves conceptual content. I think this leads to the second problem; the sources of such conceptual contents[168]. When we look at Adelaide, we see shapes of buildings, spatial arrangements and so on. But we also see colour, and this is problematic. Modern science describes the universe in terms of, molecules, atoms, electrons and protons; this is our description of the matter of the universe; colour drops out of the picture here.

> [If] this account, or anything like it, is true, then it seems that the world that perception gives us is a mere sham. Colour, sound, taste and smell, for instance, play no part in the physicist's account of matter, although perception treats them as characteristics of physical objects.
>
> <div align="right">(Armstrong, 1961, p. 156)</div>

Robinson (1994) thinks that scientific accounts destroy other, once thought primary qualities, such as solidity, shape and so on. Berkeley (1710) also thought the distinction between primary and secondary qualities artificial. If an object is coloured, it must be extended in space, so taking colour as secondary and spatial extension as primary makes no sense. You cannot have one without the other. Set aside these other concerns for the moment and focus on colour.

Science suggests that the world is not coloured, yet our representational/ intentional states give us the perceptual experience that it is coloured. Our representations etc., are not accurate[169]. Our perception of space in Adelaide, if this account is correct, involves illusory representations/intentional states. We see the colours of the trees, of the car driving along the street, of people's faces etc. Yet these qualities do not exist in the objects themselves[170].

Our perception of time may well be disanalagous with our perception of

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[168] This is not to say that the problem is brought about by Lowe's claims here; rather that invoking conceptual content entails naturally the problem of the source of that content. Lowe suggests tentatively a dispositional analysis of conceptual content where objects are taken to possess properties that dispose us to see them as being coloured, for example.

[169] There are other arguments for the failure of perception to accurately represent the world *as it actually exists*. For example, the argument from error focuses on our experience of straight sticks as being bent in water, of round coins looking elliptical and so on. The stick itself *is* straight, the coin *is* round. But our experiences are *bent* and *elliptical*. Robinson (1994) follows a long tradition in invoking sense-data to solve this. Our experiences of straight sticks as straight, and as bent, are evaluated according to the same criteria; since the same stick can be seen as being *bent* when in water, and *straight* when in air, Robinson thinks we must, instead of being directly aware of the stick, be directly aware of the sense-data of the stick, which is brought about by the stick itself.

[170] I do not intend here to set out responses to the problem of perceiving colour when science suggests that the world is monotone, and so on. I merely point to this as a problem for the perception of space to show that whilst our 'perception' of time is disanalogous to the naïve view, it is analogous to theories that take perception of colour, etc., to be mind-dependent. See Robinson (1994) and Maund (2003) for further work on the general problems of perception.

space as set out above, but that was based on the naïve view of space. Perception of space is problematic since we need an account to distinguish perceptual mental states from other states. This is available, but shows that the naïve view of spatial perception is largely in error. Further, our perception of space, if the argument of science goes through, involves systematic illusion; we see colour when science suggests the world is monotone. We might think that the perception of shape is more fundamental than our perception of colour. There does seem to be something, perhaps a property, by which we know that a triangle has its geometric shape. However, there does not seem to be a similar property, by which we know that a car *is* red. It may well be that the perception of time is *more like the perception of colour* in the context of space.

4.   *Perception of Time as Mind-dependent*

Our perception of space is a multi-layered experience, involving direct visual access (to some features), the misperception of other features *as* being coloured etc., and the conceptual use of space in our reasoning. This is our analogy for the perception of time. What we need to do now is work out precisely what we mean when we say that a thing is mind-dependent. Recall the distinctions between ET_1 and ET_2, where ET_1 is the system that provides the 'temporal field', and ET_2 the mind-dependent features of the universe. We have some idea of how ET_1 operates; it gives us a 'temporal field', some of which is direct, we 'see' the Present Moment, some of which is mind-dependent, some of which is used conceptually. It is these latter claims that I turn to develop here.

The problems facing a mind-dependency thesis of time are similar to the problems facing the mind-dependency thesis of colour. Theories of colour need to explain our experience of colour without dismissing those experiences, nor adopting a naïve view without good reason, since that naïve view is challenged by science. There is one key difference where time is concerned. The problems facing time are compounded by McTaggart's Paradox. Any account setting out the mind-dependence of time needs to both pay appropriate weight to our experience of time as being A-ish, but not put too much weight on it. We need an account that is A-ish enough to explain our experience, but not so A-ish that it conflicts with science or introduces McTaggart's Paradox into the objective world, without significant justification.

There are three ways of thinking about the A-ishness of our experience of time:

> 1.   A-ish experiences occur at the level of thought.
> 2.   A-ish experiences occur beyond the level of thought, but still within the realm of experience.
> 3.   A-ish experiences are veridical.

1., is, I believe not A-ish enough, and 3., is too A-ish. This leaves us with 2. Before turning to look at 2., a few brief remarks about 1., and 3.

If, as 1., suggests, the A-ishness of our experiences resides in our thoughts *about* those experiences then two things follow. First, we merely dismiss the A Theory as mind-dependent; second, we cannot explain the richness of our temporal experiences. Thoughts just are mind-dependent so we need not account for their ontology (outside of the mind/brain). But ordinarily, and non-reflectively we *do* think that A-time resides outside the mind/brain; we think A-time is ontologically significant. 1., does not pay enough attention to this claim. Thoughts that time *is* A-time does not explain why we *experience* time as being A-time. It just says we think time is A-time. We need an account that explains this, without resorting to 3.; that time *is* A-time. 1., is not A-ish enough to explain our experience.

Whilst 1., is not A-ish enough, 3., is ruled out by McTaggart's Paradox and conflicts with science so counts as too A-ish. Any attempt to claim that time *is* A-time is going to have to resolve these two problems. We would require significant reasons for rejecting the science and a complete and coherent resolution to McTaggart's Paradox, which has yet to be offered. 3., is too A-ish.

This leaves us with 2. In Part Two I set out to examine the phenomenology of our experiences to sort out what features of our A-ish experiences are veridical and what are mind-dependent. What I want to do here is look at ways to construct ET_2 as mind-dependent. I want to work out a theory of mind-dependency that a) restricts A-properties to our experience; and b) allocates a role for the properties of Ontic Time itself. Without meeting the second claim we may just fall back into 1., and our theory would not be A-ish enough to explain our experiences. Without a role for Ontic Time, a mind-dependency thesis is not A-ish enough.

5.   *Mind-Dependency*

I have set out Epistemic Time both as the system that provides the 'temporal field' (ET_1) and as mind-dependent properties of (Ontic) time itself (ET_2). I have yet to say what I mean by mind-dependent. Here I rectify that omission. If our theory is to explain why we experience time *as* A-time, we need an account that gives a role both to Ontic Time and Epistemic Time. Only the cooperation between the two will solve the problem of A-ishness; be A-ish enough to explain our experiences, but not so A-ish that we introduce McTaggart's Paradox or have a problem with science (SR).

Take our event, a red car driving along a street with music being broadcast from the car's radio. We experience this event in A-time. Suppose that the Present Moment is the moment when the car passes a bench. We can break up that event as follows: into past, where the car is approaching the bench; present where it is at the bench; and future, where the car is leaving the bench behind. Each moment succeeds the previous moment, so succession is involved. Whilst all this change is going on we notice that certain things endure. The car stays the same colour; the road stays the same and so on. Given this description we can, summarily allocate the notions of past, present and future as A-properties of the event; leaving aside succession and duration for later development in Part Two.

We can use this example to get a grip on what we mean by mind-dependent. When we say that the Present Moment is mind-dependent, we mean that without the presence of observers the event *being present* would go unobserved. '*Being present*' is mind-dependent, and what this means will generate our concept of mind-dependent in general.

As with 1 – 3 above, the mind-dependent thesis could allocate *being present* as

> A.   a property of thoughts about the event
> B.   a property of our experience of the event
> C.   a property of the event itself

A is not A-ish enough, since we do not just think that the event is present, we experience it as *being present*. C conflicts with science and entails McTaggart's Paradox. Leaving us with B.

The question is how to construct B. We need a role for Ontic Time otherwise B collapses into A, and is not A-ish enough. Too much of a role for Ontic Time and B inflates to C, and becomes too A-ish. The event, call it X, occurs in space-time, and has certain phenomenal features: colour, sound, smell, movement and so on. Our experience of that event is concurrent with it. Our perception of the car involves more than a bare perception of it, for we remember where the car has been and

anticipate where the car will go. We compare our present perceptions of the car *being at the bench* with past perceptions of it. There is something different about the present perception, the phenomenal features of the event itself are dynamically present to our senses; past perceptions are dull by comparison. This suggests that to get a grip on what the mind-dependence of *being present* means, we require a concept of pastness. We also see that car as *being present* because we anticipate that since the car has been moving in the past, that it would be moving in the future; the car is at the bench *now* and that will change. This gives us the experience of the car being present, of having been past and that it will be future. My perception of a car passing a bench involves the memories of past positions of the car and anticipations of where that car will be. These are events, and events that occur in Ontic Time. The car passing the bench is between the car approaching the bench and the car driving away from the bench. The qualities of these events bring about my sorting these experiences into past, present and future.

The concepts developed here are concepts not involved in the event itself, but in our experience of that event; it is no part of the car that I *remember* where it has been. This suggests that ET1 plays some role in our experience of Ontic Time. To do so, there must be some mind-dependent properties of the event that brings this experience about, if our theory is to satisfy B., above.

Return to the analogy with perceiving Adelaide. We saw that the perception of space was multilayered, involving concepts and perceptions. Suppose that we wish to travel from shop A to shop C. We use our mental map of Adelaide to travel North up one street. This brings us to shop B. We know, from our mental map that to reach shop C we need to turn left and travel for some 200 metres. The visual experience of looking at shop B does not involve such information. We layer our perception with spatial knowledge to navigate the city.

So it is with our experience of time. Our perception of the car *being present* is a mix of present perceptions and temporal concepts such as past, future etc. This is a complex arrangement involving an interaction between ET1 and ET2. The system involved with the perception of an event generates the triplet past, present and future. The car is not past, present and future; and neither is our perception of the car. We perceive the car, remember where that car has been and anticipate where it will go.

An analysis of this type is proposed by Hartle (2004). Hartle proposes an Information Gathering and Utilisation System (IGUS) generated on the above lines. Hartle models such an IGUS as follows:

NOTE: This diagram is included on page 119 of the print copy of the thesis held in the University of Adelaide Library.

Hartle, 2004, p. 2

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The information from A flows into the system (the dotted box). At P_0 that information is considered to be present, it then passes on to P_1. When it does so the information at P_3 is either rejected (forgotten) or utilised. C and U represent conscious and unconscious, and can be likened to present and memory. The registers $P_0 - P_3$ represent the memory of the recent past. Present behaviour is informed by current perceptions and previous perceptions, both in the recent memory and the store. The U processor uses all information gathered to generate an information base upon which we can build a schema for behaviour. The IGUS uses the most recent perceptions and information processed in the schema to predict the future. Hartle (2004) posits our present experience within C. In C present perceptions, memories of past experiences and anticipations of future actions combine to build the temporal nature of those experiences. Here we see that the system operates on information as it enters the system and moves through it. The experience of a car driving along the street may well operate as Hartle suggests. As X passes through the system it brings about certain actions *of* the system, which we experience as past, present and future.

Developments in cognitive science also suggest that this approach is appropriate. Eagleman and Holcombe (2002), for example, claim that when we decide to snap our fingers we do not notice a difference in time between the decision to snap our fingers and the sound made by that snap. Our perceptual system processes the signals for up to 100ms before our auditory experience occurs. They think this suggests that 'the brain carried out some temporal sleight of hand' (Eagleman & Holcombe, 2002, p. 323). Our experience is structured in time by the system. Eagleman et. al. (2005) build on this. Reviewing experimental results that suggest, whilst signals in the brain are processed at different speeds in different neural regions, the signals get aligned in time and correctly attached to external events to enable our action and 'decoding the barrage of temporal patterns at our sensory receptors' (Eagleman et. al., 2005, p. 10369).

The concept of mind-dependence involved here is similar in ways to the secondary quality debate in perception. Colours etc., form secondary qualities of our experiences brought about by the objects of that experience. Whether these secondary qualities are sense-data, qualia or intentional states will not be decided here. Nor do I intend to posit what is involved in Epistemic Time as mind-dependent. I just suggest that Epistemic Time is mind-dependent, and this dependence is analogous to the mind-dependence of colour.

Having drawn an analogy with secondary qualities, we need an account of how Epistemic Time operates. Naïve Realism is ruled out, since this would be too A-ish, taking us to be in direct access to A-properties of time itself. But this leaves us with many options. We could adopt representationalism, whereby, our experience represents in some way the world as it is, but that some of the features are features intrinsic to the representations themselves.

We could adopt a sense-data theory, where we are directly aware of temporal sense-data in the mind/brain and indirectly aware of time itself through such sense-data. Epistemic Time then is some sort of Epistemic Temporal-data. Some of that data would be erroneous, in ways that sense-data theorists (such as Robinson, 1994) say that we can explain visual illusions by referring to misbehaving sense-data. When we see a straight stick as being bent, we really see a bent-shaped sense-data of a straight stick. When we see some event as *being present* we are directly aware of temporal-data, not present in a mind-independent universe.

We could adopt an adverbial theory, whereby we are seeing a straight stick '*bently*'. Adverbial theories tend to be focused on the perception of colour, where I am seeing '*square-redly*', when looking at a red square. Adverbial theories tend to focus on the intrinsic qualities of our experiences. Some have adopted qualia as

phenomenal qualities to explain our sensory experiences. When I see a red square I experience a red-square qualia. Temporal-qualia could involve presentness, pastness etc. When I see an event as *being present*, I really experience a *being-present-qualia.*

We could adopt a reductionist, sophisticated direct realist view. Here we are in direct contact with objects, because light is reflected from those objects and causes responses in the mind/brain. Some of the phenomenal features of the objects are mind-dependent, but we are in some sort of primitive contact with some properties of the object. Perception here becomes a function of the mind/brain with objective features and subjective features[171]. Epistemic Time could operate in this way. In which case, unlike previous characterisations we are in direct access with some objective features of time, but our temporal experience has some subjective aspects.

I do not intend here to decide between these readings, merely point towards them as possible interpretations of Epistemic Time. All we need to do here is set out Epistemic Time as analogous to ordinary perceptions. We misperceive in several ways and many theories have been developed to account for these misperceptions. A full-blown account of Epistemic Time is not required here, merely a setting out of some of the possible ways it operates.

There is one way that Epistemic Time is disanalogous to perception of colour. Epistemic Time takes on some of the features of Ontic Time whereas perceptual states, however described, do not take on the features of the perceived objects. For example our experience of duration must itself endure. The experience of duration takes on some of the qualities of the thing being perceived. Our experience of colour does not take on the qualities of colour, however. An experience of red is not itself red.

Just as perception of space gives us a visual field with veridical information and other, non-veridical information, our 'perception' of time delivers a 'temporal field' involving veridical and non-veridical information. Our perceptual system is more obvious to us, and I here propose that Epistemic Time be taken to be an analogous function of the cognition of our mind/brain. Epistemic Time involves the interaction of a mind/brain-system (ET_1) and mind-dependent features of Ontic Time itself (ET_2). I do not set out how that system operates, merely point to ways it *could* operate.

6.   Conclusion

I have set out here what I mean by Epistemic Time and tried to give an account of what being mind-dependent means. I take it to be mind-dependent in the way that colour is mind-dependent. Colour requires a system that recognises it, and time requires a system that recognises it. Our experience is derived from Ontic Time, but cannot be reduced to Ontic Time. This is why our experience of time is so different to our understanding of time. Epistemic Time is involved in our experiences in much the same way as our senses are involved in our experiences. Epistemic Time is involved in every experience we have because it provides the structure for that experience. This involvement is much the same as that of our senses being involved in every experience that we have. We do not assume our senses are mind-independent. We assume Epistemic Time to be mind-independent and this assumption is a mistake.

My task in Part Two will be to examine the concepts associated with time and place them either into Epistemic Time, Ontic Time or both. A number of temporal features suffer from false ascription: we mistakenly associate features of Epistemic

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[171] See Maund, 2003, Chapter 2, pp. 25 – 50.

Time for features of Ontic Time, and this creates the discrepancy between our understanding of time and our experience of time. This examination will take the form of a phenomenological study. Before I turn to this in detail, I first intend to propose a Husserlian construction of the phenomenological method to be adopted. Once a method has been derived I then employ that method to generate some raw phenomenological data. Once this has been done I turn to a fully detailed analysis of the phenomenology of time. There I will conclude that the Present Moment, of all the identified features of time (succession, duration and direction), is a feature of Epistemic Time alone. We then project the Present Moment from Epistemic Time onto Ontic Time. This projection is the source of the incompatibility of our experience of time and our understanding of time.

Chapter 10
Phenomenological Methodology and
The Phenomenological Data of Time

1.   Introduction

Epistemic Time is the time *included in* our experience; Ontic Time, the time *within* which that experience occurs. We have a general idea of how Epistemic Time works, but we need to make this explicit. That is the task for Part Two. First, we need to settle on a method for analysing our experience. I propose to use phenomenology, a descriptive method that focuses on experience. My aim in this chapter is to explicate what I mean by phenomenology and generate through that phenomenology some data to be used to further analyse four features of time: duration, succession, the Present Moment and direction. I will take phenomenology to be a method that assumes no philosophical theory; it is merely a descriptive method that allows us to closely examine the things/entities we experience. This method will describe the features of time that we will sort into features of Epistemic Time, of Ontic Time or of both.

2.   Phenomenology and The Description of Experience

There are many conceptions of phenomenology. The phenomenology I will adopt is largely derived from the early Husserl. Here I set out my favoured conception of phenomenology, as a method available for the investigation of the world. I then set out how others, notably Husserl himself, Heidegger, Merleau-Ponty and others have taken phenomenology to situate my theory within the phenomenological tradition.

I adopt the view that phenomenology is a method that concentrates on a detailed description of conscious experience, without the need to generate any explanations, make any metaphysical assumptions, promote any traditional philosophical positions or respond to any philosophical questions. Here we describe our experience. Suppose, for example I describe this cup. I include in my description all the phenomenal features of it, its shape, size, colour, position in space and so on. I also include my thoughts about the cup, and anything else that might be included in my experience. This generates information, descriptive data, which acts as evidence for our theories, but also counts as in need of explanation through those theories.

Phenomenology is a method for generating pre-theoretic data, just as science is a method for generating data. I do not claim that phenomenology is completely free of theory, nor that we cannot be mistaken. Rather, phenomenology is a method that attempts to make explicit the theory involved, if any theory *is* involved. The reason for this lies in the challenge of the myth of the given. Before turning to this, and showing that phenomenology can escape such a charge, a brief remark on the importance of theory-free information gathering.

McLure (2005) thinks that pre-scientific description is important; it gives us neutral information to act as a guide to see whether scientific results are accurate.

> [Unless] the validity of our pre-scientific understanding of
> time remains at least partly in force, as what a scientific
> theory elaborates, then the scientific theory cannot say why it
> is a theory of time rather than of 'tonk'.

<div align="right">(McLure, 2005, p. 169)</div>

McLure thinks that the best way to develop a good understanding of the world is to have many different ways to think about reality, and that all these ways are employed to provide a holistic description.

If McLure's reasoning is correct, it seems to follow that we can only verify the accuracy of science as an elaboration on reality if we have an objective standard against which that elaboration is measured. Merleau-Ponty (1962) certainly thinks that we need an objective set of data derived from phenomenology as a first-order enterprise to be analysed by science/philosophy as second-order enterprises.

This view seems to rely on phenomenology as giving us unfettered access to reality. This sounds like the 'myth of the given', the idea that we have pre-theoretic and naïve access to objects of experience. If so, then phenomenology will not give McLure his objective evidence, since it assumes we are always in a non-theoretic perceptual relationship with the world. The myth comes in various forms, but all seem to have one key element.

> [Man] can conceive things in the world as being of a certain
> kind with the help of self-verifying states without having
> concepts about what it is to be of that kind.
>
> (Tuomela, 1988, 182)

In other words, according to the myth we have non-conceptual access to the world.

The myth is often rejected because it assumes that perception is concept-free where the objects perceived have not been affected by the cognitive processes employed in our experiences of them. The belief seems to be that we make epistemological use of non-epistemological information. But this data is usually set out as ideas, and ideas *are* epistemological. If so, then the thought that our epistemology deals with non-epistemological and naively veridical components counts as a myth. Phenomenology needs to avoid the myth of the given.

Phenomenology does face the challenge of the myth of the given. As a method it assumes that we can have access to the world. But it does not follow that it assumes this access is theory-free. Roy (2003) for example, argues that since phenomenology has yet to adopt a single method, only some phenomenology can be criticized for entailing the myth. Notably, Husserlian phenomenology, which I will adopt, is largely innocent of this charge. Husserl both wants to analyse the experience and the theoretical underpinnings of that experience; as such he could, and we can, overcome the myth by acknowledging it explicitly as part of the foundations of our experiences. The myth of the given then is surmountable.

Compare phenomenology with other attempts to describe experiences. For example, sense-data theories posit and justify the existence of sense-data in the mind/brain of the observer to explain sensory experiences. Some sense-data theorists, such as Robinson (1994), argue that we need sense-data to explain visual experiences, including the failure to distinguish between experiences of bent sticks which *are* bent and ones which are straight but are in water so *appear* bent. To explain the illusion we invoke sense-data and, since illusory and veridical perceptions appear the same, we should invoke sense-data to explain all perceptions.

Phenomenology in the way that I will take it, does not assume any underlying concepts or ideas required to explain our experiences: phenomenology describes experience and does not try to explain it. Once we try and explain the phenomenology we have moved beyond the data gathering exercise and have started to build a theory. Further, to escape the myth of the given, we ought to make explicit any possible theoretical structures built *into* experiences. This, in fact, will tie in with the chapters to follow, since the aim there is to explain the data and the possible role played by ET_1 in our experience of time as represented by that data.

Husserl took phenomenology as an exploration of the foundations required for any science, without imposing any philosophical theory or position; it generates the data upon which we build our theories. Phenomenology does not replace or supplement metaphysics or science; it precedes them. Once we have generated the

data we are free to do metaphysics, psychology, physics and so on. This sets phenomenology up as a foundational exercise upon which we build all other sciences. This view I will reject. I instead see phenomenology just as a method, comparable, but no better or worse, than other methods for studying the world.

We have reason to believe that phenomenology is not a necessary pre-condition for the pursuit of scientific/philosophical enquiry. It is a tool available for our use, should we wish to focus on our experiences, rather than other tools, such as statistical data for psychology, thought experiments for science and philosophy, and so on. Phenomenology is the purely descriptive method of generating the data upon which we can build a theory[172]. If this is the starting point for our enquiry we need to be clear about the assumptions we have to make about this data. I believe we need to make at least one assumption about the data derived from our own experience: that our experience is of a mind-independent world[173]. Only on this assumption would we even attempt to explain our experiences. This view of phenomenology is one derived from the tradition of phenomenological inquiry started by Husserl, so a brief outline of Husserl's phenomenology, specifically the version I adopt follows.

3.   *Husserl's Phenomenology*

As I follow one of Husserl's constructions of phenomenology, I turn here to set that out. There are other constructions, but set them aside for the moment. Husserl took phenomenology to be a method, one free from as many assumptions as possible. At one stage he argued that we should make one assumption, that (some of) the objects we experience have some ontological status. Later he rejected this claim as another assumption to be suspended, as all other assumptions are suspended when using phenomenology as a method. I will simply set out the realist claim, as this is the one I will be adopting.

Husserl takes phenomenology to be a neutral field of research which forms the root of several sciences. He thinks logic is the method of all science and shows that phenomenology is essential to lay bare the ideal laws of logic. Farber (1943) takes Husserl to develop a general investigation that would enable the analysis of the real objects of logical investigations.

> What is needed is something more general, an investigation
> belonging to the objective theory of knowledge and to the
> pure phenomenology of experiences of thought and
> knowledge.
>
> (Farber, 1943, p. 209)

Husserl tried to develop an a priori analysis of the laws of thought etc.

Husserl took phenomenology to be a science of "phenomena" (Husserl, 1913, p. 41). As a method phenomenology enables us to describe conscious experience and its relationship with all types of objects, both mind-dependent and mind-independent. As a method, we reject any assumptions we have about our awareness of objects; we must not assume anything. This has come to be called 'bracketing'. Having removed all subjective prejudice, we begin a phenomenological reduction. We begin with everyday experiences, as they are given to us. We identify the

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[172] Whilst this definition is all I have to say at present about phenomenology, there are several useful discussions and interpretations, in, e.g. Farber, 1943; Moran, 2000, 2002; Merleau-Ponty, 1962 (especially the preface); Smith and Smith, 1995a; Sokolowski, 2000.
[173] There are two issues where veridical accounts of phenomenology are concerned. First, is the data described a veridical account of our experience; second, is that data veridical of the world. In other words is the phenomenology a true description of our experience only, or a true description of the world, independent of that experience. I think the assumption should be that the second view is at least possible.

presuppositions essential to our perspective. We then set these aside as limitations on our knowledge. Once these restrictions are removed, we are free to describe in minute detail the experience we have of the world. Husserl follows Kant in taking knowledge to have limits.

> Natural knowledge begins with experience and remains *within* experience. This is that theoretical position which we call the "natural" standpoint, the total field of possible research is indicated by a *single* word: that is, the *World*.
>
> (Husserl, 1913, p. 51, original emphasis)

This view counters the myth of the given; it should account for the operations of the mind/brain that are involved in our perceptions and experiences.

Intentionality links our conscious life to the world; consciousness is consciousness *of* objects that transcend our being. Husserl restricts knowledge to knowledge of appearances, but that knowledge is intentional and has objects as content: objects that are external to our consciousness, and the source of their appearance. Talk of the appearance of objects does not suggest a distinction between appearance and reality. Rather, the object *is* as it appears to be.

Husserl believed that phenomenology takes us back to the things themselves; it deals with the phenomena as objects we experience in exactly the way we experience them and deals with our different ways of relating to objects via intentionality. To have a relationship with this cup, I must be in the same place as the cup. The cup is real and in the world, just as I am in the world. Because the cup and I are in the world together, we are in some form of temporal and spatial relationship.

Hintikka (1995), argues that in some senses phenomenology cannot or does not in Husserl, capture these relationships. By removing the object from its context entirely, we do not then know how that object relates to other objects at all.

> The main difficulty with an account of phenomenological reductions which sees in them a method of concentrating one's attention exclusively on [the one object] is that far too much will then end up being bracketed.
>
> (Hintikka, 1995, pp., 79 – 80)

But Hintikka assumes that a reduction must, or needs to, reduce our attention to the one thing, and phenomenology ought to reject that move. As a method we can employ phenomenology to examine our conscious experience, an experience always *embedded* in a context. As such the context has to be included within our sphere of study, otherwise Hintikka's conclusion would follow. The lesson here is to not arbitrarily isolate one object. If a full isolation is required then we require an explanation for that.

I adopt significant parts of Husserl's phenomenology, and will develop these in the following chapters. Here phenomenology is a method to describe experiences without assuming any theory or making any assumptions. Husserl is sometimes criticised as being committed to idealism, but I reject this claim; the phenomenology of Husserl here is clearly realist[174]. I turn now to see what phenomenology can show about our experiences of time. A phenomenological enquiry will, I believe, demonstrate the role of Epistemic Time in our experiences; make clear the cognitive functions that alter our experiences in such a way that our understanding is significantly different to our experience of time. Before turning to this, I want to look at claims by Dainton (2001) that a phenomenological study will demonstrate

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[174] I develop this further in chapter 14.

some conclusions about time. I then generate some raw phenomenological data to be used for later analysis.

4.   *Phenomenological Conclusions and Time*

Dainton (2001) suggests that we might be able to draw conclusions from a phenomenological study of time: 'it may well be that our experience of time reveals something (if not everything) about the nature of time itself' (Dainton, 2001, p. 93). The key phrase here is 'if not everything'. He compares this with scientific thought, which plays a significant role in the conclusions we draw about time. Dainton believes that phenomenology also plays a role. Phenomenology allows us to 'learn something about time by examining *experience itself*' (Dainton, 2001, p. 109, original emphasis).

I doubt that we will be able to draw conclusions in the way that Dainton is suggesting. We may be able to draw conclusions *from* our investigations, but a properly bracketed phenomenological study will not include those conclusions. Phenomenology prepares the way for those conclusions, possibly, but when we start to make such a move, we need to acknowledge that we have moved beyond phenomenology and are developing our theory *about* the data gathered. If our study just describes the phenomenological contents of our temporal consciousness, then any conclusions drawn must be derived from a theory, above and beyond the phenomenological study itself. To suggest as Dainton does, that the phenomenological data will lead to conclusions about time itself must be questioned, if that study is undertaken correctly. Later Dainton concludes that we may not be able to draw such conclusions about time itself, but that we can draw conclusions 'about the time in which we live' (Dainton, 2001, p. 107). This is a more reasonable approach, and it is one I will adopt, subject to some minor adjustments.

We first need to establish what exactly is meant by the term 'in' within the phrase 'in which we live'. There are many ways to employ 'in'. Compare 'the house *in* which we live', and 'the way *in* which we hold a tennis racquet'. Here 'in' implies two different things; the first use implies an existence within a house; the second implies a method of holding a tennis racquet. If 'in' is taken to mean the time *within* which we live, as we live *in a* house, then we are making a judgement about time itself. What we ought to mean here by 'in which we live', should be construed along the following lines. We find ourselves inside an environment, a world. That world has certain temporal features, made apparent to us through our experiences; features such as a past, a present and a future. *This* is the world 'in' which we live. I am using 'in' in a different way to Dainton, for I am not referring to the time in which I live, but to the experiential context of these experiences. To make this more explicit, consider a house in which I live. We distinguish between the house itself, of mortar and bricks etc., and the situation involved with the household; whether I rent the house, own it and so on. Here we see the two ways of employing 'in': The first refers to the physical realm within which I live; the second refers to the way that I live in that physical realm, the way I *exist in* it.

It is this second sense, where 'in' is taken to be some type of existential, intentional method of existence that could be derived from a phenomenological study. We can then draw conclusions from any phenomenological study of the time that appears as the content of our consciousness; the time that we *exist* in. A purely descriptive study demonstrates the situation we find ourselves *in* without making any assumptions about time itself.   If we can provide a clear analysis of the temporal content of our consciousness, any further claims or conclusions should be the result of theory and argument, not taken from the phenomenological data itself.

In Daintons defence, we could distinguish between a descriptive conclusion

derived from the phenomenological data, and the theoretical hypotheses used to explain them. Phenomenological descriptive conclusions are integral to the data, and involve drawing data together. Theoretical conclusions explain why the data is drawn together in this way; they are *about* the data, descriptive conclusions can be considered to be *part of* the data. Consider the phenomenology of the Present Moment. In our description of the phenomenology of the Present Moment we include components drawn from the past and from the future. A descriptive conclusion (if we accept this description to be correct) is that the past and the future are somehow involved with the Present Moment. We then go on and draw theoretical conclusions about the Present Moment, e.g. that it is not entirely distinct from the past and the future. This teaches us that we ought to be very careful when using phenomenology as a method, to ensure that any conclusions drawn are signposted as descriptive or theoretical. Dainton fails to make this clear.

5.   *Phenomenological Subtleties*

When engaged in phenomenological analysis it will be worth noting subtleties as and when they arise. An example of this can be derived from Dainton's (2001) claim that we notice persistence and change. When we look at a piece of chalk and close our eyes and open them again we have two perceptions of the chalk, even though the objects of that perception are identical. The contents of our experience are separated temporally, but there is a persistence in the object itself; there is no separation in the object, only in our experience *of* the object[175]. We have an experience of persistence, in the object, and change, in our perception of the object. But this is not an observation of change, per se. Dainton believes that our typical experience is of change *and* persistence. We observe and experience change and persistence, not only in our experience, but as an experience of something else. This cup of coffee is hot and *then* it is cold. This is a change we perceive, and not a change in our perception. There is a persistence involved here (the coffee) and also change (it's temperature). With the chalk example, our perception itself changes but the chalk does not. The change observed in the chalk is a change imposed on the chalk, not one inherent to the chalk. Dainton is interested in the change we associate with objects and this is right, but we need to be careful that we do not project change in our experience of an object (the chalk) to be change in the object itself.

6.   *Data Gathering*

Having made explicit the particular conception of phenomenology that I will be employing, I now turn to use this method to generate some phenomenological data. A starting place for the phenomenological features of time to be analysed is the triplet of past, present and future. I follow Heidegger (1927) who thought that the best starting point for any investigation is the immediate and ordinary assumptions we possess. This triplet is a good place to start, for it is at the heart of our assumptions about time. This triplet is the most basic appearance of time; it is what we are phenomenologically given. But on further investigation we will find that this triplet is not the only temporal content of our consciousness. There are additional data: of duration, succession and direction. These are central to the flow of time; when we talk about that flow, we are talking about (at least) these notions, as well as the Present Moment, the past and the future[176].

Our first task is to provide a descriptive study of the time that is apparent to our consciousness. A rigorous and exhaustive descriptive account of time should

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[175] See Farber, 1943, p. 513.

[176] See also, Russell, 1948, for an inadequate identification of the properties of time, esp. pt III, chapter v, where he equates only change and notions of before and after with our experience of time.

include all the features of time that appear to our consciousness, in exactly the way that they appear. I will develop three phenomenological scenarios involving time and employ them from here on. This is a basic data gathering exercise so no conclusions will be drawn about them.

Scenario 1: The Quiet Street

You are walking along an empty suburban street. There are houses on both sides and trees line the pavement. There is the occasional parked car. There is no wind and it is silent. You stop at a bench and sit down. Your experience is now of complete stillness, no movement whatsoever.

This experience tell us that there is movement, but not in the objects *of* perception. I can sit on the bench and experience change even though there is none observable; I may not be able to see change but I can experience it. For example, I can think that 'it is very quiet today'; there is a change from the 'it' to the 'today'. We experience change that is not observed and *takes time*. So we get an idea of time involved with our experience, independent of the objects (the street) of that experience[177].

You think to yourself 'it is very quiet today'. There is a duration involved in the thought. You can only consider it to be an entire thought because the whole of it is held in your consciousness 'as a thought'. Your experience here is of some sort of duration *in* or *across* time.

Your experience moves *from* the 'it' *to* the 'today'; it has direction. The thought moves in the one direction, from what we call the past to the future. The fact that there is movement from the 'it' to the 'today' suggests that our experience of this *thought* is not simultaneous. We do not see it *all* in the way that I have been suggesting. We may hold it in our memory in such a way to make it a whole thought, but we do not experience it in this way. We experience one point of it *at a time*. That experience moves from the 'it' through the 'is' etc., to the 'today'. It does not move from the 'it' to the 'today', back to the 'is', on to the 'today' (again) to 'quiet' and finally to 'very'. This moment moves in the one direction successively. Each experience directly succeeds the previous one and will be succeeded by the next one. Each moment in time succeeds one and precedes the next.

This direction and succession are obvious because of some privileged moment in time variously called the 'now', the 'Present Moment'. Our experience seems constrained to one moment in time at a time: the Present Moment. From that moment we distinguish between the past, moments we have experienced, and the future, moments we have yet to experience.

We have identified the key issues involved with our common understanding of time. These features have several side issues, but these do not concern us here. Here we are only interested in describing the time that appears to our consciousness. We have identified these features through introspection, by focusing on the phenomenology of thoughts. But we also observe these features in the real world. To make this clear I turn to the second scenario.

Scenario 2: The Noisy Car.

The scene is the same as 'The Quiet Street', but after sitting on the bench for a few minutes you hear a sound coming from your right, a mixture of music and the sound of an engine. A red car then passes you and as it passes you recognise the tune coming from the car's radio. Here we have the same sort of experiences as we did

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[177] Assume for the moment that thoughts are not objects of experience.

with the 'Quiet Street'. You observe an extension in time, a duration, where the car remains the same despite its movement; you observe succession, the car moves one step closer to you at a time, and the sound gets incrementally louder then softer. You also note that these features are viewed from the Present Moment, the privileged moment in time.

Let us first deal with the duration. The observation of duration is problematic in several ways. Husserl claims that the perception of duration implies the duration of perception[178]. Can we be said to observe duration? I believe we can, in two ways. First, we note the stability of objects in our experience. I observe a car drive down a street. That car changes its position but does not itself change. This means that the car is extended in time, and we can perceive that because our perception is extended in time. Second, when I observe the car at a later point it appears to be the same car that entered the street. Seeing it at that time entails that it has endured from the earlier time. An instant perception can give us some clue to the duration of objects. It is the first sense of perception that Husserl is interested, but both apply, I believe.

According to Husserl, we cannot distinguish between the duration of an object and the duration of our thoughts of the object. But the distinction is needed if we are to separate the duration of our perception and the duration we observe. We need to be clear what is happening in our experience, whether the duration we experience is something *that we observe*, or if it is something we *impose upon* experience. Duration is also a phenomenological datum; it is the evidence for our inquiry. If we construct that inquiry correctly then the answer may be self-evident. Bearing this in mind, the phenomenological picture derived from the experience of the car does involve duration. The car remains the same even though it moves from one position to another constantly. We observe a duration that is clearly involved with the car. Its existence at time T is the same as its existence at time T^{+1}[179].

The experience of the car is restricted to one instant in time. You only ever see that car and hear the tune one moment at a time. Yet to make this experience intelligible you must somehow concentrate beyond that moment. Take the tune. You are only aware of one set of notes at a time, yet you recognise the music *as a tune*. You do not recognise it as a series of notes, you recognise it as a tune, a coherent entity. Even though your perception of the tune is restricted to the Present Moment, your recognition of what that sound is, is not restricted in this way. Similarly, your recognition that the car endures is not restricted to the Present Moment. If your experience were restricted in this way, you could not observe the duration involved with the car. As James notes:

> *The knowledge of some other part of the stream, past or future,*
> *near or remote, is always mixed in with our knowledge of the*
> *present thing.*
>
> (James, 1890, p. 120, original emphasis)

Experience of the Present Moment is not of a moment isolated in time, but one moment mixed with many others; they are intertwined. It is not just your present experience that is phenomenological given. The phenomenology of that moment involves anticipation of the future and memories of the past. Involves the notions of past and future.

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[178] Husserl, 1928, p. 42.

[179] My talk here of the duration of the car implies that I adopt endurantism: the view that objects/events pass through time, as opposed to four-dimensionalism, or perdurantism, which holds that objects/events are extended across time – or in time. I prefer four-dimensionalism, but the language I use will be ordinary language for this issue is not pertinent to my theory, indeed my theory can be adopted by either view so I need not decide between them.

You also observe successive movement. The car moves from one position to its neighbour. With this movement you experience a change in the intensity of the sound. You also experience direction. The car seems to move, both from the right, to the left *and* from the past into the present. This is real movement, both in time and in space.

We have looked at fairly simple scenarios first of sitting at a bench and noticing nothing except for the movement of time, as inwardly constituted. Our second scenario involved observing a car and its motion. What then of a far more complex example, of sitting at a desk, writing a thesis? The phenomenology involved here is really rather complex.

Scenario 3: The Busy Student

I am sitting at a desk, typing a PhD Thesis. Whilst typing I have several contents of consciousness. The feel of the keyboard as I type, the look of the screen, its place on the desk, besides a cup of coffee and bottle of water. The desk is cluttered. I also smell the coffee, hear the sounds of the road outside, and of other people moving around in the corridor outside. I experience these activities in one instant whilst looking at the screen. These are the contents of my consciousness. But there is more. I am typing a thesis, and I am thinking about what to write, and placing that within the context of what I have already written and what I want to write.

My experience of writing my thesis is of typing, which takes place in a spatial context, at a desk with water and coffee; and in a temporal context, where my current typing is informed by my previous activities, of typing earlier sentences, of arriving at the office, of waking up etc. My typing is also done with a (future) purpose. This is the temporal context of my *present* experience; that experience is intertwined with past experiences and expectations of future experiences.

In the first two scenarios observation was important. In the first we experience time both through introspection and thoughts and observation (of duration). Our temporal knowledge is inferred from the activities of thoughts. Thoughts become the contents of consciousness. In the second scenario we focused heavily on the observation of a car and how we can take movement and sound to be entire objects and unified despite the fact that we only perceive one moment at a time. In this third scenario we have a mixture of the two; our observations of objects outside of our consciousness and the thoughts invoked during those observations. There is an intention in the activities described – it is directed to the future: I have agency; *I* am typing. To some extent the contents of my consciousness are informed and directed by my thoughts. So when typing my thesis I am aware that it is my actions that are of central importance. *I* am typing my thesis and my conscious acts bring this about.

Whilst typing my thesis I note that the parts that I have written remain on the screen, and so have endured. Each moment when I type succeeds an earlier moment, such that words appear on the screen in the correct order 'the' is written 't' 'h' and then 'e', and in no other order (if spelt correctly). 'The' is not formed by typing 'e', 't' 'he' and then reconstructed afterwards. So this succession is orderly and sequential. It also has a direction; it moves *from* the 't' *to* the 'e', not from the 'e' to the 't'. And this all occurs one moment at a time. The words are not typed simultaneously onto the screen. They appear one letter at a time.

7. Conclusion

As a start to Part Two, I have been concerned here largely with methodological issues and data gathering. This was driven by the need to work out how exactly Epistemic Time captures the role of the mind/brain in our experiences of time. Given that the mind/brain *does* play a role in our experiences of time, we can employ phenomenology to examine the features of our experiences to see if those experiences are of an ontology of time best described by the A, B or C Theories. I have set out phenomenology as a purely descriptive method of philosophical analysis. I developed some preliminary sketches of the phenomenological data of temporal consciousness: duration, succession, the Present Moment and direction.

As a preliminary sketch the analysis here has been inadequate in a number of ways, but we can compensate for this in the following chapters where I deal with the phenomenology of duration and succession, of the Present Moment and of the flow of time. These features were developed here in a way that seemed to show some sort of *natural* progression, this was more a reflection of the writing, not something obvious from the data gathered. These cases are of equal importance and the order in which they are tackled is somewhat arbitrary.

Having settled on the appropriate methodology for Part Two and developed a general understanding of the features of time to be subjected to that method, we can now go on and sort our experiences in the following ways: between those experiences brought about by our interaction with Ontic Time, and those imposed by, or projected, *onto* Ontic Time. This is the problem that we will face in the following four chapters.

Chapter 11
The Phenomenology of Duration and Succession

1. *Introduction*

Having drawn an analogy with the perception of 'secondary qualities' such as colour, and promoted phenomenology as a method for gathering data about the 'lived' experience I turn here to phenomenologically analyse some of the concepts involved in our temporal experience. This will be done to give an account of the ways in which Epistemic Time operates. Whilst I will suggest some explanations of the phenomenology, my task here is first to set out the phenomenological nature of our temporal experience, and then motivate a need for distinguishing between features of mind-independent Ontic Time, and features of Epistemic Time, which is mind-dependent. That mind-dependency may well be constructed in many ways. Here I am only interested in motivating the need for such a distinction.

I will focus here first on duration, where there might be little debate between the A-, B- and C-theorist, and succession, where there might be slightly more debate between these theorists about the ontological structure involved. I set aside for the next chapters an investigation at the heart of the dispute, the Present Moment and the so called flow of Time.

2. *Phenomenology of Duration*

I will here develop in more detail 'The Quiet Street'. This will give us an insight into one aspect of the temporal contents of experience. I have said that there will be little debate between theorists about duration. This is because duration, whether conceived in A-ish, B-ish, or C-ish terms is not contentious. We can agree that temporal extension exists. It is how it is constructed that is at issue. I set this second problem aside. I merely want here to look at the experience of temporal extension. I used this example in chapter 10 to sort out different temporal concepts involved in experience; here I focus only on the one, duration.

I sit at a bench in the middle of a quiet street. I look at various objects. For example, I look at a tree. The leaves move slightly, it has particular colours, called green, brown, and in some light, grey. I continue to watch the tree, but the light changes and so does my experience of the colour; the shades of the colours vary with the intensity of the light. As light fades the green of the leaves become more variegated, but also more dull. The bark changes from brown towards a more greyish brown. As light increases the green leaves lose some of their variation, some start to shine, and the tree seems brighter. The bark appears more brown, but some areas grow darker as shadows develop.

There is some movement; the leaves sway, as do some of the branches. I infer from this that there is some other movement going on, only that you cannot see it. I turn my focus onto my other senses and note a slight movement in the air. The movement of air against my skin seems to be slight, and in a different direction.

I note that this is the *same* tree. I do this because I have continually looked at it. Whilst the colours and brightness have changed, as has some of the trees shape, the essence of the tree has remained the same. By essence I merely mean that some aspects remain the same. Its spatial location, relative to the road, and my position has been stable. Some features of its shape have stayed the same. The more solid looking branches and the trunk have stayed stable. The location of other things relative to the tree have remained stable also. The house behind the tree is still the same house and so on.

Since the focus of my perception has been on the tree, with some acknowledgement of the surrounding, I could be said to be aware of the duration of

the tree. Some of the things, aspects perhaps, of the tree have changed, its hue, the shape and scale of the shadows from it's leaves, the position of some leaves and branches. I note that I have been looking at the tree for some time and infer that the tree has existed during that period.

This 'noting' also brings out an aspect of the experience not evident in a pure description of the perceptual qualities of the experience. I note that the tree has existed for a while, but so has my experience of the tree. Here such noting seems to identify two things; the duration of the tree, and the duration of my experience of the tree. This suggests that my temporal experience itself has temporality. Husserl notes that our perception of events in time is only possible if our perception is one that encompasses those events. We only notice an extension in time if our perception is itself extended in time, something he called a 'temporally comprehensive act' (Husserl, 1928, p. 40).

> It is certainly evident that the perception of a temporal object itself
> has temporality, that the perception of duration presupposes the
> duration of perception, that the perception of any temporal form
> itself has its temporal form.
>
> (Husserl, 1893 – 1917, p. 24)

It seems that things such as trees are not the only things that can endure. For my experience of trees itself endures. To experience duration my experience has to endure.

Clark (2006) claims that we can also experience time as having been long. You are at the Opera, and the soprano has hit a high note and is maintaining it. You experience the timbre, the tone and the pitch. But after a while you also, Clark thinks, experience that note as having been going for a long time[180]. This suggests that some sort of evaluation is going on. Experiencing the length of the note is different to experiencing that note as *being long*.

This 'noting' of extensions in time, and of experiences as being long also suggests that thoughts themselves can be spread out in time. For example, whilst looking at the tree I can think 'it is quiet today'. This thought can itself be taken to be an object. I note the whole meaning of the sentence once it is complete[181]. I can treat the sentence as an object of later reflection. For example, were a car to drive past with music playing on its radio I can think back to this sentence and think it now mistaken. It was true that it was quiet; now it is noisy, and so on. But this is getting ahead of ourselves a little.

Return to the original thought, that 'it is quiet today'. This comment is itself spread out in time, so has its own duration. It is not only objects that endure, but thoughts also endure. The duration of watching the tree and the thought coincide. I sit there, thinking about the silence, but looking at the tree. Part of my experience of the tree is a thought about the world in which that experience is had. I also note that various aspects of the tree are changing. The tree now looks bright. The 'now' here implies and involves the thought, whether it be implicit or a memory, of the tree looking dull before hand. It also involves somehow the expectation, based on memories of changes in past perceptions perhaps, that the tree will change its brightness in the future.

Whilst I experience the tree as existing for some time, so enduring, my experience is had from one moment. Recall my search to find some explanation for the movement of the leaves. I had searched for a cause, and felt wind against my

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[180] See also Noë (2006).

[181] This is not to infer that we observe thoughts, or that we require some other (higher) level of thinking to have thoughts in the first place. Nor that the meaning of the thought is only imparted once complete; only that a thought itself can be held as an object once it is complete.

skin. I then compared the wind on my skin with the movement of the tree. I noted that the motion of air on my body was inconsistent with the movement of the leaves. I noted this because I compared the movement of air on my skin with the movement *at that moment* of the tree's leaves. Not only am I able to note the temporal extension of the tree, and my experience of the tree, I can also make temporal judgements within that experience. The apparent inconsistency here follows from the thought (mistaken as we know) that what is happening here, should be happening at a close location, if they occur at the same time.

When I later reflect on that experience, I seem to be able to reflect on the *whole* of that experience. I seem to represent duration simultaneously. To explain this Husserl thought that we have two types of retention. In one we can remember the experience in the way that we lived it. In another we can alter the duration such that it becomes an object experienced, as if it occurred simultaneously. He referred to this as double intentionality[182]. If I turn my attention away from the content of that experience to the experience itself something strange occurs; that experience is 'retained "all at once"' (Husserl, 1893 – 1917, p. 87). He used such reasoning to point towards a difference between the time we experience and the experience of time.

The lived experience of sitting watching a tree in a quiet street has brought out some of the concepts involved with time; duration, change, simultaneity. My focus here has been duration so I have abandoned the project now that other concepts become involved. We can draw some preliminary conclusions from this, albeit brief, description. First duration is something we do experience. We can also experience the duration of different types of entities. I experienced the duration of the tree, but also the duration of *my experience* of the tree. Thoughts also have duration. Such a distinction gives us grounds for suspecting that we can derive a difference between the duration that we experience, and our experience of duration. Husserl certainly thought so and I follow him here. He drew this conclusion because a temporal spread can also be experienced as objects, and this implies that they can be treated as occurring simultaneously.

Before turning to develop this suspicion in greater detail I look at the phenomenology of succession. Here the phenomenology will add further grist to the mill for driving a clear distinction between the time we experience, described ontologically by Ontic Time, and our experience of time, which may, indeed, I will argue, will, include elements of Epistemic Time. This difference will allow us to draw an analogy with the perception of supposed secondary qualities such as colour, to get a grip on ways in which Epistemic Time could be mind-dependent.

3.   *The Phenomenology of Succession*
For duration I focused on 'the quiet street', since this seemed the most appropriate example for the analysis of stability. For a phenomenological analysis of succession I turn to the example of a car disrupting that street. Having done this we will have two steps upon which we can build a distinction between time as it is, and time as it is experienced.

Whilst sitting at the bench, looking around the street I start to hear noise, with no definite direction as a source. The noise grows at a steady pace and it seems now to be coming from my right. The noise soon becomes discernible as the sound of a cars engine, together with other noises, possibly music. A red car enters the street on my right and drives down the road, quite quickly. Music is coming from the car's stereo and I recognise the tune. This event happens quickly and I watch the car,

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[182] Husserl, 1893 – 1917, pp. 84 – 88.

listen to the tune, think about the loss of the silence of the street, but also recognise the tune, hope the car will go away; see the colour, red, of the car and so on. Soon the car leaves the street and the noise levels return to their earlier peaceful state.

Unlike 'the quiet street', I did not have much time to phenomenologically analyse the incident as it occurred. However, some things were obvious from the experience. First, the noise levels preceded the appearance of the car. At the time I could not tell from which direction the car was coming, nor whether it was a car. Then the car entered the street. The growth in noise was gradual and led me to expect the arrival of something. I then watched the car; I saw its shape, colour, and also its movement. It started out at the end of the road to my right, moved along the street, passed the bench where I was sitting, and then along the street and finally out of it. The noise seemed to grow and decrease concomitantly, with the relative location of the car to me.

I saw the movement of the car. This movement did not appear to be the car being in one position then the next. The car *moved* and I could not notice precisely how the car moved from one position to the next. By focusing on the car the background became blurred. The car itself remained the same, the same colour, with a few changes in reflections on its body, though I could pay little attention to this because of the speed of the car. The wheels moved, and moved so fast that I could not really see the details of the wheels and tyres[183].

I experienced the car as being in one position, then the next. This suggests that the car was in one position and *then* moved to another and so on. But this move did not happen simultaneously. The car entered the street, *then* drove along it, *then* drove passed the bench and so on. My experience involved a sequence of actions, with a beginning point, several in-between points and an end point. The position of the car was noted at a single moment, a moment which was succeeded by another moment, where the car's position was also noted; and noted as being (slightly) different.

I also noted that the car travelled fast. This seems to involve a comparison made, during the experience, with other experiences of cars, driving, it seems, slower. It could suggest a comparison with my experience, which seemed impelled by the car, seemed rushed by the movement of the car. Either way, a comparison was made during the experience.

Some information here about time seems to be presented. My focus on the movement of the car has, in some ways, given an insight into time itself. Husserl (1893 – 1917) thought that through such experiences time becomes constituted.

> The flow of consciousness that constitutes immanent time not only
> *exists* but is so remarkably and yet intelligibly fashioned that a self-
> appearance of the flow necessarily exists in it, and therefore the
> flow itself must necessarily be apprehensible in the flowing.
> (Husserl, 1893 – 1917, p. 88, original emphasis)

In the experience of succession, or flow, we seem to have some sort of primitive experience of that flow itself[184]. The flow seems to be a continuous connection

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[183] This is familiar to those who have ever watched a wheel. The faster it moves the less distinct the features observed.

[184] Whilst this may suggest the myth of the given, note that Husserl acknowledges here that consciousness constitutes our experience. We cannot infer from this that he thinks the experience of a mind-independent flow is naïve. Merely that the experience of the car moving down the street gives us an interpretation of how time itself appears. This seems to point towards a dynamic time, but that we could constitute time in terms of single moments moving along, or being next to in some loose sense – in B-ish or C-ish terms.

between moments, perhaps discrete, perhaps dense. This is how the car moves, in a continuous way, with no obvious suggestion that the movement is dense or discrete.

A central part of this experience was of the tune playing on the car's radio. I recognised the tune, even though I experienced one part of it at a time. Husserl (1893 – 1917) thought that this phenomenological experience was quite significant. Music occurs sequentially, one part at a time. Yet we are able to experience that tune *as a tune*, as a single entity, not merely as a sequence of notes; and we can compare that tune with memories of tunes. I recognised the tune, so must have compared a sequence of notes, heard successively, with a sequence of notes held in memory. Husserl distinguished between primary memories and retentions. When we experience a sequence of notes, we are conscious of both the present tone, and the tones previously experienced, which are being pushed back into memory. These are primary memories (or remembrances).

> I am conscious of a continuity of phases as "immediately past" and
> of the whole extent of the temporal duration from the beginning-
> point up to the now-point as elapsed.
>
> (Husserl, 1893 – 1917, p. 26)

Here I am conscious of the movement of the present moment, and its link to the recent past.

Compare this, where I am directly connected to these memories, with what Husserl calls retentions. Retentions are memories not directly connected to present perceptions, but brought back into the focus of consciousness, under the guise of double intentionality. We experience that retention both in the order, or sequence, that it occurred but also as being in some sense simultaneous. He speaks of the first type as retentions that have transverse-intentionality, the second as retentions that have horizontal-intentionality[185].

By focusing on the tune I direct my attention to the transverse-intentionality of the retention, where the tune 'stands before me, constantly expanding in its duration' (Husserl, 1893 – 1917, p. 87); i.e., it is remembered in the order and way that it was originally experienced. But when I focus on the temporality being constituted by the tune, I direct my attention to the horizontal-intentionality of the experience. I experience that temporal spread as I would a spatial, visual spread. Here Husserl is trying to get a picture of how time is constituted in our experience, and thinks that by focusing on that time, as represented by the tune, we somehow take it to be retained all at once. For Husserl, this suggested that the time focused on here was not the time of the tune, but the time of the experience of the tune; a time we reconstruct in our consciousness.

> I must first grasp the retentional being-all-at-once itself, and this is
> continuously being modified; indeed, it is what it is only in the
> flow. Now the flow, inasmuch as it modifies this retentional being-
> all-at-once, coincides with itself intentionally, constituting a unity
> in the flow.
>
> (Husserl, 1897 – 1917, p. 87)

The key point here is that Husserl thinks that we experience only the one flow. If we can then intend a tune as flowing, but also intend that tune as stationary then the very notion of flow becomes highly problematic. To solve this he points to the double intentionality aspect. There really is a single unified flow, but this has two ways of being represented to us. But the flow here is really the flow of our experience. Double intentional reality would be problematic.

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[185] Husserl, 1893 – 1917, pp. 86 – 87.

Return to the movement of the car. When the car leaves the street I am aware that the moment when the car entered the street has somehow 'moved' further away from me. I see it as being pushed into the past in such a way that the time between the car entering the street and the car leaving street has a fixed extension, and that at the moment the car leaves the street that I am 'looking' back along that extension; as it is kept in Husserl's primary remembrance perhaps. As the noise decreases I experience that movement of the car through the street as falling back even further into the past. This event is no longer seen as vital, Husserl thinks. It is seen as something dead; 'a formation no longer animated by the generative point of the now but continuously modified and sinking back into "emptiness"' (Husserl, 1893 – 1917, p. 26).

We seem to be able to constitute time itself through the experience of a car driving down a street. I will build on this claim in the next chapter so will reserve comment for then. We experience the event from a specific moment, in some dynamic way. But we can later represent it to ourselves as an entire object. The succession seems to involve movement away from our present position *by the event just experienced*. I want to turn now to an analysis of succession and a re-examination of duration to motivate the need to distinguish between the time we experience, Ontic Time, and our experience of time, Epistemic Time.

4.   *Succession, Duration, and Film*

I have phenomenologically examined duration and succession and through that brought some clarity to the lived experience of time. I want here to change examples and look at shared experiences of watching a film. The phenomenology reported through such experiences suggests that duration alters according to the interests of the observer. If so, then the speed of the succession might well have altered. If so, then we should take this fluctuation in speed to be about our experiences, not time itself. First I will look at duration, then succession.

Two people can respond to the same event in different ways. Say my wife and I watch the same movie. We watch it at the same time, and afterwards we compare impressions. I say that I liked the film and that it was over too quickly. My wife says that she hated the film and it was too long. Is it the duration *of* the film that has varied, or the duration *of our experience* of the film that has varied?

My experience was of *being involved* with the film. Not having time to consider whether actors were acting well, or whether particular scenes are well motivated etc. I watch the film and do not have the time to consider some of these critical issues. My wife, however, reports that she sat there wondering when the film would end, why actors were doing certain things, questioning some of the language etc. She seemed to have much longer to analyse the film, during the experience. I however, seemed to have little time for this analysis.

We can compare the clock readings of the film itself. It started at 7.45 and finished at 9.35. The film had a duration of 110 minutes. But our experiences of that duration vary considerably: our experience also lasted 110 minutes, but that 110 minutes was experienced in a different way. For me it went quickly, for my wife, slowly. This does not point to a difference in the duration of the film, but a difference in our experience of the film[186].

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[186] Studies in psychology and cognitive science support the claim that our attention has an impact upon our experience of time. Coull et. al., 2004, undertook studies to show that our attention to time affects our experience of time. Subjects were asked to pay attention to time, to time and colour or to colour alone. They found that the more subjects paid attention to the passing of time itself, the longer time seemed to pass. But it is not obvious from the phenomenology of film that my wife's experience is brought about by her taking her attention away from the film, to time itself. Though this may be an

This experience also has ramifications for succession. I experienced the film quickly. It was like watching the car drive past. I had little time to contemplate other issues about the film. My wife reported that she had ample time during the movie to contemplate many issues. It seems, then, that the film *passed* quickly for me, but *slowly* for her.

Pockett (2003) argues that the speed of our experience of time reflects the sampling activity of consciousness. The more we have to pay attention (sample) to our surroundings the slower time seems to pass. Whilst reading we do not have to sample the external world too often and time passes quickly. When playing sports, by contrast, time passes slowly because we are constantly sampling the external world. Pockett concludes that paying attention is the guiding factor for the speed of succession. The more attention we pay, the slower time passes. Pockett constructs what we can call her 'sampling thesis' along lines of paying attention internally (such as reading) and paying attention externally (such as playing sports)[187]. Time passes quicker when paying attention internally, slower when paying attention externally.

There are, however, cases where paying attention externally involves the 'speeding' up of temporal experience and these act as counter-examples to Pockett's sampling thesis. Pockett argues that when faced with life threatening situations, time slows down. However, when undertaking an examination for a high grade in a martial art, for example, the moments pass quickly, even though live weapons in the form of knives and swords are being used. Here inattention could prove fatal, but time passes quickly. Compare this with some menial, non-life threatening task, such as weeding the garden. Time passes slowly if you do not like gardening. In the first case, we are constantly 'sampling' the environment; in the second we are rarely

underlying cause of her experience. I suspect that this difference can be explained by noting that paying attention to a film is not like paying attention to colour. See also Nobre & O'Reilly (2004). Matell and Meck (2000) summarise research that shows that our experience of time (in the seconds-to-minute range at least) can be altered by drugs, disease, modality and context. They invoke a system incorporating a clock, memory and decision components, and believe that it is the clock component that is modified by drugs, disease etc. They believe that attention processes can influence interval timing and affect the clock component, (Matell & Meck, 2000, p. 96).

However this may not be an entirely one way street. Other studies suggest that our attention to time is modified by time itself. Barnes and Jones (2000) propose an interactive model to explain the effect of attention and expectancy on our experience of time. They hypothesize that attention to temporal events such as speech or music is partially controlled by the speech or music. They believe that if temporal events guide our attention in an analogous way to spatial layouts guiding visual search tasks, then the time relationships between stimulus elements influence our attentional control. If we recognise certain patterns amongst the stimuli, then this guides our expectation for future stimuli.

Barnes and Jones compare approaches to expectancy based on probability and statistical reasoning. They prefer a third approach, tying expectancy into stimuli time relationships, 'people tacitly rely on these relationships to anticipate the "when" as well as the "what" of future elements' (Barnes & Jones, 2000, p. 258). To test this claim, they set up an experimental task that requires judgements about time intervals based on perceptions of temporal patterns. They wish to know whether experiences of such time patterns affects future time judgements. They identify two main stimulus features that appear to systematically affect attention and time judgements, both being contextual in nature, and related. Expectancy of future patterns seems first to be influenced by the timing of a sequence of musical notes. The perception of a patterned sequence of notes effects the expectation of future patterns, and judgements about time. The second contextual influence on time judgements involves the absence of such patterns. In the absence of musical patterns, listeners were less accurate at judging time intervals. See also Carlyon (2004) who raises issues about the neural basis for perceiving sounds and the affect of attention on the processes involved.

[187] Note however that there is a problem with her example. In what sense is reading *not* paying attention externally? To read is to pay attention to something outside of the self, so in a technical sense cannot be said to be paying attention internally. Pockett also refers to writing and thinks these two activities predominantly internal. What Pockett should say is that paying attention to mental things such as thoughts, ideas, hopes etc., alters our experience of time. But this seems to be a different claim entirely.

'sampling' the environment. According to Pocket time ought to pass slowly in the first case, and quickly in the second, yet this is not obviously the case[188].

If succession fluctuates according to something as internal as our preferences, this entails that this fluctuation is involved only with our consciousness, not what that consciousness is of[189]. My wife and I experience the same film, but our experiences differ significantly. If so, then these fluctuations should be taken to be about our experiences of duration and success, not of duration and succession themselves. We can build on this to show how Epistemic Time is analogous to our perceptual system.

5.   *Duration, Succession, and Perception*

The pictures of duration and succession as experienced here suggest parallels with perception. If duration and succession fluctuate with the interest of the observer, it seems more reasonable to conclude that this fluctuation is somehow brought about by the experience, by Epistemic Time, rather than by the time we experience. This is where we can flesh out a little the analogy between Epistemic Time and perception.

Where duration was concerned I spoke of experience of the essence of the tree, and particular aspects of the tree, for example. In many ways the experience of duration can be likened to perception of 'secondary qualities'. I spoke of aspects of the tree changing, whilst the essence of it stayed the same. We could use this to generate a distinction between the perception of so called 'secondary qualities' such as colour and brightness, and 'primary qualities' such as shape and spatial location.

The experience of duration, specifically, its length seems quite analogous to this. The length of the film seems to be different for me, and for my wife. Just as we can report differences in our experiences of colour, and thus motivate a need to distinguish between the appearance of the object and the object itself. However we explain that difference, such reported differences suggest that some of the features of duration, as experienced through the film, are mind-dependent. Here then we have a brief analogy between the 'perception' of duration and perception of colour.

Whilst the analogy works in many ways, it also breaks down. It does so mainly because our perception of colour is not itself coloured. The colour is the object of our experience, so we do not need to invoke a coloured experience to explain the experience. But to perceive duration, our experiences *have* to endure. This means that the experience takes on some of the features of the object of experience. This makes little sense where perception is required, for colour experiences are experiences of colour, not experiences that *are* coloured. But the

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[188] Another interesting complication is suggested by Mozer and Miller (1998). They distinguish between clock-based segmentation of time and event based segmentation. In clock-based segmentation, we break up our experiences into specific moments of time, say a millisecond, and this gives us a uniform segmentation of time. Event-based segmentation occurs when we use events in our experience to distinguish between moments in time. Suppose you travel to work on a daily basis. Because the route is familiar to you, every object is familiar, such that you pay little attention to it; so time passes quickly. But now suppose you change jobs and have to travel a different route, every object is novel so you pay attention to that. Mozer and Miller think that we would experience time slowly in this case. 'If our perception of time is event based, meaning that higher centres of cognition count the number of events occurring in a temporal window, not the number of milliseconds, then one will have the sense that a familiar trip is shorter than an unfamiliar trip' (Mozer and Miller, 1998, p. 371). The thought I would develop in response to this is that driving to work involves continuous sampling of the environment, yet if this description is correct, time varies within that experience. This too suggests that Pockett is mistaken.

[189] Husserl notes that this flux appears to fit in with our observations, but this conformity cannot be taken to indicate that the flux is part of these observations (Husserl, 1928, p. 100).

experience of duration has to be extended in time, so does take on some of the features of duration itself.

The analogy is not perfect here. But all we need is a grip on what might be involved in Epistemic Time being mind-dependent. That duration changes between experiences suggests that certain aspects of those experiences are mind-dependent. Similarly with succession. That I experience the film in a completely different way to my wife, more analogous to watching a passing car than watching a tree, is a fact of my experience, not succession itself. The fluctuation of speed seems a prime case for mind-dependency; just as variations in colour between perceivers is a prime case for mind-dependency.

I have fleshed out a little the analogy between Epistemic Time as mind-dependent and the perception of colour etc. In the next chapter I want to turn to develop in greater detail an account of the phenomenology of the Present Moment. Before turning to this, a brief account of ways which duration and succession could be taken to exist in A-, B- and C-theoretic terms[190].

6.   *Duration, Succession and Theories of Time*

In many ways theorists of time can agree about the existence of duration and succession. Things are extended in time, and occur non-simultaneously, i.e. in some sort of order, succession. The differences between theorists come to light when we come to account for our experiences of them.

An A-theorist could take our experiences to be veridical, i.e. experiences of duration and succession that themselves act in the ways that we experience them. Note that we still need an account here of the fluctuation in speed developed above. But there is no reason that an A-theorist would have to say that *all* the features of duration and succession are mind-independent.

Both B- and C-theorists would agree that there is such a thing as duration and succession, but that many of the features of our experiences of them are mind-dependent. As such both would be happy with a mind-dependency thesis; though they would be construed in different ways. I won't construct them here, just point towards a mind-dependent thesis as the solution to the fluctuation in speed phenomenon.

7.   *Conclusion*

Here I have undertaken a phenomenological examination of duration and succession. I have lumped them together partly because of their role in motivating a distinction between the time we experience, Ontic time, and our experience of time, Epistemic Time; partly because the existence of duration/succession is accepted within A-, B- and C-theoretic frameworks. The phenomenological study undertaken here brought out some of the concepts involved with the lived experience of time. Duration involves an extended experience of time; succession a flow of a single moment in a continuum, to use Husserl's term. However, the extension of duration and speed of succession vary with the interests of the observer and this signifies a difference between time itself and our experience of time. This showed that the analogy between Epistemic Time as mind-dependent, and perception of colours etc., as mind-dependent brings out ways in which we could take Epistemic Time to be mind-dependent.

I turn in the following chapter to develop the phenomenology of that single moment in time and the flow in which it is buried. Here there is greater

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[190] McTaggart himself laid the basis for our experience of time at the feet of perception. He thought we perceived a time-less world in A-ish terms because of our perception of the world.

disagreement between theorists. A-theorists tend to think that there is something privileged about this moment, and that the flow is real. B-theorists deny that this moment is significant (beyond being mind-dependent). A C-theorist would also hold that this moment is mind-dependent.

Chapter 12
The Phenomenology of the Present Moment

1.   Introduction

Having looked at the phenomenology of duration and succession and drawn out some of the ways in which we can take some of our experiences to be mind-dependent, I turn here to look at the phenomenology of the Present Moment. I will focus both on the phenomenology of the Present Moment, and ways in which we might explain it. The Present Moment is the centre, I believe, of the difference between time itself and our experience of time. I will look at two theories, of Dainton, and Husserl. I will prefer Husserl, because his theory gives us a more plausible mechanism for explaining the phenomenology of the Present Moment. Dainton's theory lacks this mechanism and suffers as a result.

2.   The Phenomenology of the Present Moment

For a phenomenological analysis of the Present Moment, I turn to the 'busy student', where I am sitting at a desk, typing a PhD Thesis. Whilst typing I have several contents of consciousness. The feel of the keyboard as I type, the look of the screen, its place on the desk, besides a cup of coffee and bottle of water. The desk is cluttered. I also smell the coffee, hear the sounds of the road outside, and of other people moving around in the corridor as well as on the street when delivery drivers appear. I experience these activities in one instant whilst looking at the screen. One moment seems to change into another. Whilst watching the screen, noises change, the person next to me makes a noise. Each moment seems different.

There is more to the experience than such perceptions. I am typing a thesis. This is an account of what I am doing. Typing involves transferring words onto a computer. However, I am not just typing, which could involve reading a book and translating the printed page onto the computer. I am typing a PhD thesis. I am typing words onto the screen with no external, phenomenal source. These are my *thoughts*. Typing a thesis involves having thoughts and at any moment I am transferring those thoughts to the screen.

Several things seem to be in my attention simultaneously. I am aware of the colour of the green bottle, and the feel of the keyboard. I am aware of these and the words on the screen, and of the words I intend to type on the screen. I am also aware of the noise of people in the corridor, as well as the music coming up from a delivery truck outside my office window.

To know what I am writing now, I need to know what has been said. This could be accounted for by the presence of words on the screen, but the screen only holds a small proportion of my thesis. Suppose I am in the middle of writing the sentence "to know what I am writing now, I need to know what has been said". Take "now" to be the Present Moment. I perceive the words "to know what I am writing…" on the screen, have '*now*' in mind to type "now" and "…I need to know what has been said" in the future. The conclusion of my thought here seems to sit in my conscious attention as I type "now".

I also worry whether this sentence is the right one: whether it fully expresses my thought in a clear way; whether it is in the right place; whether it is necessary for the argument I am developing; whether it plays a role in a paragraph, section, chapter and thesis that is of the appropriate standard. My experience of typing involves several types of thoughts, as well as feelings, since my worry feels like a hole in my stomach. I am also consciously aware that my hands are cold and that my typing is likely to involve mistakes. From this I worry that my typing will be sporadic and so on.

Here we have a brief phenomenological analysis. Some further work is required to elucidate the issues. The Present Moment seems to pass quickly, so an analysis of it has to be done mostly from without; i.e. the analysis occurs in a later Present Moment. As such here the analysis is more like trying to analyse the noisy car at one moment as it moves along the street. Observation of stable, and in some sense motionless objects such as trees allows us to carry out the phenomenology within the experience. Analysis of more dynamic events such as succession and the Present Moment does in some sense involve an abstraction. In a sense we have then to move to a post phenomenological analysis.

3. *Post Phenomenological Analysis*

Here then we have a picture of the phenomenology of the Present Moment. Some initial comment is required, and I will link these to some of the conclusions drawn about duration and succession. As noted the analysis of the phenomenology of the Present Moment involves some abstraction. To get to this point I first need to lay down some grounds to be farmed from the analysis of duration and succession. This will not take too long.

Both duration and succession were experienced in a single moment. I have separated the concepts here to get a clearer grip on the lived experience of time. But part of the lived experience appears to us as a *single* continuum. This is something Husserl recognised.

> This continuity forms an inseparable unity, inseparable into
> extended sections that could exist by themselves and
> inseparable into phases that could exist by themselves, into
> points of the continuity.
>
> (Husserl, 1893 – 1917, p. 29)

If Husserl is right here, and I suspect he is, then the phenomenology of time is in some sense an abstraction, or reflection on experience. He thinks them an abstraction that can only exist within a continuum. My separation then is a tool to analyse several aspects of the same thing: the continuity of time[191].

Even so, we do seem to experience duration and succession from the vantage point of a single moment. But that moment is fleeting; it is continually moving back into the 'past'. So any analysis, as I have pointed out, is somewhat hampered by the inability to carry out a phenomenological study from within the experience; reflection rather becomes the phenomenological tool.

Such reflection however can suggest some phenomenological interpretation. First, note that my typing of the sentence "to know what I am writing now, I need to know what has been said", involved perception of words on the screen, present intention to type "now" and an intention to type "…I need to know what has been said", in the future. In a sense here, the future plays a role in present experience. So does the past. Here the first part of the sentence is present on the screen. Suppose now that I am discussing the sentence with my supervisor. The first clause has been said, I am saying "now" and intend to say the second clause. To fully understand the use of the word "now" I must in some sense hold the first and second clauses in my attention. This suggests that the past and the future are involved in my experience of the present.

This implies that my experience, whilst contained within a single moment is not restricted to that moment. This becomes clear when we turn to music. When I

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[191] This is why, as we saw in the last chapter, Husserl distinguishes his famous 'double intentionality' for dealing with succession; one analysis is of succession *as experienced*, the other is an abstract reconstruction of succession into a single moment, representing somehow an event as a single temporal object. These two Intentionalities combine such that we only really experience the one flow.

hear music played on the radio of a courier's car outside my window, I recognise a tune. However, if my experience were restricted to a single moment, I ought only to be able to experience that moment. It might well be that I am only hearing the one cross-section of music. My experience however, as opposed to my hearing, seems to be of something more than that single moment.

I intend to follow Husserl's analysis, which I will later set out. A brief summary of his view about this will help elucidate the issue. Husserl thought that whilst we could only perceive the present tone, we can in some sense perceive the whole melody of the tune. He invoked a system of memory, perception and expectation to explain this.

> [The] extension of the melody is not only given point by point
> in the extension of the act of perceiving, but the unity of the
> retentional consciousness still "holds on to" the elapsed tones
> themselves in consciousness and progressively brings about
> the unity of consciousness that is related to the unitary
> temporal object, to the melody.
>
> (Husserl, 1893 – 1917, p. 40)

This act constitutes the melody in our consciousness by combining memories (retentions) with perceptions and expectations. Husserl thinks this the only way that we could represent the melody to ourselves.

Whilst I have yet to fully develop this position, introducing it here brings out a key element of our experience of time as lived from the Present Moment. Whilst we seem to experience a continuum of time from a privileged moment, the phenomenology of listening to a melody suggests that we in fact experience time from within the continuum, not merely a single point of it. Our experience is spread out across time. "[The] life of consciousness flows continuously and does not merely piece itself together link by link into a chain" (Husserl, 1897 – 1913, p. 56).

Whilst the phenomenology of the Present Moment is done in a more abstract manner than in duration, some key elements have been made clear. Our experience of that moment somehow reaches beyond present perceptions. The Present Moment is buried in the flow of time. I now turn to look at two theories attempting to explain the phenomenology of time in general, and specifically the Present Moment; the overlap theory of Dainton, and then Husserl's tripartite theory.

4.   *Requirements of a Phenomenological Theory*

Before turning to set out the theories of Dainton and Husserl I will set out some requirements of such a theory. There are a number of things that a theory developed out of a phenomenological study ought to do:

1. It ought to accurately describe our experience.
2. It ought to give us the tools to accurately explain the phenomenological data; it should provide appropriate mechanisms to analyse and explain the data.

Dainton's Overlap Theory and Husserl's memory-perception-expectation theory, purport to do both. I will conclude that Husserl's is the better theory.

5.   *Dainton's Overlap Model of Consciousness*

Dainton thinks that our experiences can be explained by referring only to the phenomenal features of events and a relationship of co-consciousness between them; there is no need for a momentary conscious state focusing on those contents, call this an act of awareness. Dainton's Overlap Theory has three central claims:

1. Experiences are extended in time;
2. Experiences are phenomenally tied into each other and fully explain the phenomenology of our experiences

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3. As a result of 1 and 2, the distinction between the act of awareness and the content of awareness does no work, so is not required.

I aim to show that this distinction *is* required, making (3) false, and reject Dainton's theory on this basis. I also argue that his construction of 'act' is contentious.

The First Claim

Dainton's first claim is that 'momentary' experiences are temporally extended. Each 'momentary' experience overlaps its neighbour and 'must have some temporal extension' (Dainton, 2001, p. 103): Our experience is spread out in time. When we experience the motion of a car, each momentary awareness overlaps its neighbour such that our experiences change with the change we observe. To explain how this extension works, Dainton thinks it natural to 'suppose that acts have precisely the same duration as their contents' (Dainton, 2001, p. 103).

The Second Claim

Dainton's second claim is that distinct events are phenomenally *bonded*: joined together in a single phenomenal experience, by a relationship called 'co-consciousness'. Take three events, C, D and E. These three events are extended in time, where C changes into D, which then changes into E. We are able to observe the change from C to D because our observation is extended over the same period as C and D. Now take two acts of awareness, A_1 and A_2. These acts have C, D and E as their contents, but these contents overlap.

> I have an awareness A_1 with content C-D and an awareness A_2 with content D-E, but these acts of awareness are not distinct: A_1 and A_2 partially overlap, and the part of A_1 that apprehends D is numerically identical to the part of A_2 that apprehends D.
>
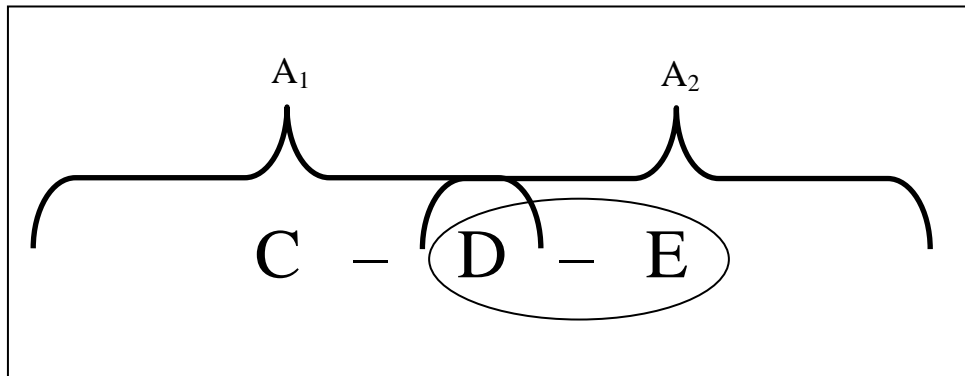> (Dainton, 2001, p. 103)

We can diagram it thus[192]:

Figure 1

Dainton thinks that this is a simplification of a complex series of almost identical conscious acts; where every act ($A_1...A_n$) overlaps its neighbour so that they differ slightly, but whose contents (C – D – E – n) do not overlap. For example in the above diagram, we do not experience D twice, but D forms the contents of acts A_1 and A_2. We do not experience one event twice if they appear in two different conscious acts. The phenomenal objects within our experience are bonded together across phenomenal time and phenomenal space by a relationship he calls 'co-consciousness'. Co-consciousness acts a little like the 'specious present' which

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[192] Adapted from Dainton, 2001, p. 103.

Dainton takes to be probably less than a second[193]. Co-consciousness is not transitive. C is co-conscious with D; I am aware of both C and D, but by the time E arrives I am only aware of D and E; having dropped out of my consciousness C is not co-conscious with E.

There are two ways that two events can be bonded within the one phenomenological act. First, two phenomenal events can be bonded in the same act if they are simultaneous; if a phenomenal cup and a phenomenal bottle are next to each other they are linked within the phenomenological act of perceiving them. The cup and bottle are seen to be in a relationship and within the phenomenological act are connected to each other. Second, two experiences occurring at different times are linked in exactly the same way that experiences that are simultaneous are linked. If I look at the bottle, then the cup, then the phenomenal bottle is linked to the phenomenal cup, even though they are not simultaneously held within the same act. These are two ways for phenomenal contents to be co-conscious with other phenomenal contents. Events are co-conscious and linked as long as they occur within the specious present. Co-consciousness connects simultaneous experiences and successive experiences.

The Third Claim

Dainton thinks that temporal experience is extended and phenomenally bonded and concludes from this that we no longer need a distinction between the act of consciousness and the contents of consciousness.

> [Since] we are now supposing that contents and awareness
> run concurrently, this distinction is doing no work, and unless
> there is some other reason for maintaining it (and I cannot see
> that there is), we are free to dispense with its services.
> (Dainton, 2001, p. 104)

Dainton takes phenomenal contents, such as sounds, pains, colours and so on, to be intrinsically conscious items. This content is experiential content, verbal and non-verbal, not merely propositional contents, such as 'I believe I am seeing red' and so on. We do not need a separate awareness to experience these phenomenal contents. They are experiences 'in their own right' (Dainton, 2001, p. 104).

> Instead of supposing that different contents (such as a sound
> and a flash of light) are experienced together by virtue of
> falling under a single awareness, we say that these contents
> are "co-conscious"; that is, they are joined by the basic
> relationship of "being experienced together".
> (Dainton, 2001, p. 104)

Dainton claims his theory can accurately explain any phenomenological experience and that his theory gives us the tools to explain the phenomenological data. I think him wrong.

6.   *Criticism of The Overlap Model*

I aim my criticisms of Dainton's overlap theory at his claim that we do not need to distinguish between the act of consciousness and the contents of consciousness. I intend to focus on three criticisms (two are related):

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[193] The concept of a 'specious present' is well known in the philosophy of time, adopted by e.g. James 1890, Mundle, 1967, Mellor 1998, Pockett, 2003. The specious present is a moment, extended enough in time to explain how our experiences endure over time. This points towards the view that the present is tied up with the mind/brain in some way.

1. The removal of this distinction proves Dainton's theory to be phenomenologically inaccurate, showing that it fails our first criterion;
2. The removal of this distinction means that we cannot explain some of the phenomenological data. This criticism comes in two parts;
    a. Attention; and
    b. Intentionality

Without an account of attention and intentionality Dainton's theory fails the second criterion, it does not give us the tools through which we can analyse the data.

Phenomenological Inaccuracy

By removing the distinction between our experience of objects and our thoughts about those experiences Dainton's theory cannot accurately describe our experiences. Take two phenomenal objects, a cup and a bottle in a co-conscious relationship[194]. I may still have thoughts *about* these phenomenal objects and about their relationship. Dainton's theory faces two problems, first it cannot capture the phenomenology of an individual having thoughts; second it cannot capture the phenomenology of a person having thoughts *about* things. These two reasons suggest that Dainton's theory is phenomenologically inaccurate. Thoughts are things *we* have not things we experience, and some thoughts are things we have about our phenomenal contents.

Suppose ϕ is the 'thought' that a cup is next to a bottle. When I think about the cup and bottle I experience the cup and bottle from a single perspective; there seems to be an 'I' that *thinks* thoughts such as ϕ. But under Dainton's theory thoughts are just another type of phenomenal contents, co-conscious with other phenomenal contents. Thoughts are no more mine than phenomenal cups and bottles are mine; i.e. derived from within my conscious mind/brain. Thoughts such as ϕ only qualify as contents of a phenomenal field, and this cannot capture the phenomenology that suggests we take thoughts to be things we *have* about that phenomenal contents. I am not solely phenomenally aware of thoughts, as Dainton's theory suggests: I *have* thoughts. We can in certain senses be aware of thoughts. I can sometimes be aware that a thought I have is a good/bad one; and this might be because we have higher order thoughts. But other thoughts are *about* the world, and about phenomenal entities. These thoughts, and the higher order thoughts seem more to be thoughts we have, not thoughts we are aware of. It seems that Dainton's theory cannot allow for this; he cannot allow that there *be* a phenomenal I to have these thoughts. Thoughts and experiences are just co-conscious phenomenal contents of Beings.

Dainton admits that the self, in the phenomenal stream of consciousness, appears to be something above and beyond the contents of that stream. His explanation for this is that we have feelings on the fringes of that stream, and these fringe feelings give us the sense that 'we are active apprehending subjects' (Dainton, 2004, p. 372). But Dainton's use of 'fringe' implies that these feelings are also part of the phenomenal field, which means that we ought not think ourselves to be outside of the field, since these feelings are *in* that field, just at the edges of it. Invoking 'fringe' feelings is an attempt to remove us from the field whilst maintaining that we are part of the field[195]. Invoking 'fringe feelings' cannot account for the

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[194] Take these objects to be phenomenal objects within our experience. When I talk of cups and bottles I use shorthand for phenomenal cup and phenomenal bottle.
[195] If Dainton wants to claim that these feelings are not in the fringe of the field, but something beyond the field, but not part of a unified consciousness, then that needs to be fully developed not alluded to.

phenomenology of our experience of *being* outside of the field. It follows that his theory is phenomenologically inaccurate.

This brings us to the second problem. Without an 'I' our thoughts cannot be *about* anything. Within a phenomenal flow there is a cup and a bottle and ϕ (a thought co-conscious with the bottle and cup). But ϕ is *about* the bottle and cup and the 'about' here implies some form of direction. To be *about* the bottle and *about* the cup and *about* their phenomenal relationship, ϕ needs a source of origin, a perspective from which to note such relationships. But without the 'I' there is no obvious and simple perspective from which ϕ can get started. A trajectory needs a fixed starting point otherwise it fails. Similarly, a thought needs a perspective, and without that perspective ϕ cannot be *about* anything.

Dainton's theory fails the first criterion; it is phenomenologically inaccurate. It takes thoughts to be things we experience when we *have* them. Second it does not account for the phenomenology which suggests that there is an 'I' from which we have experiences.

Phenomenological Tools

I turn now to show how Dainton's theory fails the second test of any phenomenological theory: it does not give us the tools to explain the data. Two related areas show that Dainton is wrong; the act/content distinction *is* doing some work. These two arguments pertain to attention and intentionality. I turn first to attention, then intentionality.

Attention

Dainton describes what he calls the 'phenomenal background' of our lives. When I look at a book, I do not simply see the book, I see it amongst a phenomenal background, of the desk it sits on, of the cup of coffee that is placed next to it, of the sounds of birds singing outside. These contents form the phenomenal background to my perception of the book.

However, without the act/content distinction, we cannot explain why the book is the focus of my attention. Dainton explains our focus in terms of force and vitality, arguing that these notions do not help the advocate of the act/content distinction. I believe the absence of the act/content distinction leaves us in a worse position. Why does this book take up the majority of my attention? Its phenomenal quality is no greater than the bottle besides it, no greater than the sounds of birds outside my window, or of the press of the chair against my legs. Yet I focus my attention on the book. We need an explanation why the book has extra force and vitality. But the phenomenology of the book itself does not seem to involve vitality or force. There is no more force or vitality in the book in my consciousness than the bottle so why focus on the book instead of the bottle? To explain this we could invoke the act/content distinction, something Dainton has ruled out.

It is because I *want* to focus on the book that it takes up my attention. Dainton's theory cannot explain this; it becomes mystical why I focus on the book over the bottle[196]. The act of awareness drives the focus of our attention and this explains why I focus on the book rather than the bottle. I am not thirsty, but want to read. Without the act, this want to read must itself become part of the phenomenal flow, as must the absence of thirst.

Dainton rejects the view that to be conscious of some object we must be paying attention. But this is different to the claim that we require an act/content

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[196] Dainton could explain this in terms of wants being co-conscious with their desired ends. But my first criticism applies. Wants are not something we experience, they are something we *have*.

distinction to explain the focus of our attention. I can focus on the book over the bottle and it is *this* that requires explaining, not that I am only conscious of things I pay attention to. I can be conscious of, without paying attention, the sounds of cars passing outside etc. The act of paying attention to the book explains why I focus on that and not the bottle. That I can also experience things I am not focused on is not relevant to this claim.

Intentionality

The second criticism focuses on intentionality. Take a cup. I consciously think of the cup, *as good for sitting for long periods* for example. I understand objects in different ways; treat them in different ways and impose thoughts upon those objects. When I look at the cup I think that coffee tastes better if the cup has not been washed. This is no property of the cup, but a way of interpreting it. I intend that cup in many different ways.

Dainton's theory has no mechanism to explain this. A concept of co-consciousness cannot explain why I interpret objects in many different ways. We could explain this by invoking a moment of awareness that mixes present and past experiences and thoughts about those experiences and so on. But Dainton has removed this, so does not give us the tools to explain intentionality.

Dainton's theory does not provide an accurate phenomenological picture, nor does it give us the tools to explain the phenomenological data. He removes the distinction between acts and contents of awareness but this elimination is not supported by the phenomenological data, which suggest the presence of a self, an 'I'. Second, I pay attention to one phenomenal object over another and without the act/content distinction our phenomenological study cannot explain this. Nor can it explain how the same object can be intended in many different and varied ways. This intentionality cannot be accounted for if we do not distinguish between the act and the content of consciousness. Dainton's claim that an act of awareness just *is* the contents of awareness fails.

7. *Husserl's Memory-Expectation Model of Consciousness*

Dainton's theory is rejected because it does not involve an act/content distinction and fails the two tests of phenomenological theories. Husserl's theory, however, invokes the act/content distinction and satisfies the challenge of accuracy and tools. Husserl argues that when we are aware of an object as present we retain a modified memory of what occurred before it, and anticipate future contents; referred to by Husserl as protention[197]. At any moment we have three contents of awareness, the retention of previously perceived objects, current perceptions and anticipated perceptions. I am listening to a tune; I retain some modified part of that tune as memory, and expect future parts of that tune[198].

According to Husserl, memory is a retention of a modified image, not the remembrance of an object. Past images are not stored in memory for later use; our mind/brain acts on them. Otherwise Bergson's claim that we could not distinguish the memory of a loud note from the perception of a soft one would apply. Husserl thinks retentional content is 'no content at all' (Husserl, 1928, p. 53). We remember

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[197] See Husserl, 1928, p. 76.
[198] Koelsch & Siebel (in press), propose a model incorporating memory to explain and investigate the working of the mind/brain when perceiving music. This model assigns different stages of music perception to different modules of a neural network. This involves pre-processing, simultaneous processing, memory, gestalt recognition. They stress the involvement of memory in the perception of discrete notes to perceive chord changes etc; to perceive musical structure we need working memory to process present stimuli and long-term memory to recognise musical regularities.

the previous sound, not *as* a sound, but as the *memory of* a sound. Memory is not a storeroom of images to be retrieved and placed in front of our consciousness, but is an active process that modifies and retains past images as ghosts of their previous (present) selves.

> Retentional consciousness really contains consciousness of the past of the tone, primary memory of the tone, and must not be divided into sensed tone and apprehension as memory... the tone primarily remembered in intuition is something *fundamentally and essentially* different from the perceived tone.
>
> (Husserl, 1893 - 1917, p. 34, original emphasis)

Retentions are memories inserted into the current contents of our awareness by an act of that awareness[199].

There are two types of memory; in a 'primary remembrance', or retention, objects in memory are linked to our present perception in a continuous duration. Our perception of the tune, for example, is a retention, for it is contained within a continuous experience[200]. We can modernise Husserl's thoughts as follows. There is a short-term memory-buffer into which we place primary remembrances. In this buffer we retain images of immediate past perceptions for a certain period and when new images are added those already in the system get shoved back and old memories fall out of the buffer into the storeroom[201].

Compare this with recollections, which involve the reproduction of an image of a past event in the Present Moment. There is no link between the present and this memory. I can, for example, listen to a tune *now* in a primary remembrance. I then note that it sounds similar to a tune heard at some earlier date (perhaps several years ago). I then reconstitute this remembered tune to compare it with the perceived tune. The retentional tune has a continuous link with the present, whilst the recollected tune, has no continuous link, although it is now perceived[202].

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[199] Gallagher refers to this by claiming that retentions fall on the side of the act of awareness, not the content of awareness (Gallagher, 2003, p. 5).

[200] Recent developments in cognitive science suggest that Husserl is on the right path here, or at least Husserl's view is consistent with such developments. Staddon (2005) for example, argues that memory strength (in Husserl's terminology, primary remembrances) can act as an internal clock. The failure to find a neuro-physiological pacemaker suggests that an alternative to the standard internal clock explanation for interval timing is required. Staddon thinks that a clue to this lies in the fact that not all events are equally effective as time markers. Internal clocks are thought to develop by repeated exposure to timings of events, which allows us to anticipate future timing patterns. If not all events are useful for this development then internal clocks may not necessarily develop. So, Staddon thinks, we need an alternative. He thinks that memory strength can act as a clock for interval timing.

Steddon proposes a simple threshold model to show how memory strength can act as a clock. Suppose that a fixed interval event occurs (breakfast, then lunch). The strength of the memory of breakfast reduces in intensity until we remember that it is time for lunch. The strength of the memory of breakfast passes an intensity threshold and we respond to that.

What we need to explain, if Steddon is right, is the creation of such a threshold, given the possibilities that different people have different memory strength capacities. If different people have different capacities we need to explain why they respond, *if* they do respond, at the same time to interval stimuli. Steddon acknowledges that a lot of work needs to be done to support this idea. He does, however, propose memory as central to our experience of time.

[201] This analogy is mine, not Husserl's. It is loose and only intended to give an idea of how it works. Some psychologists tend to reject this claim, arguing that we do not learn and retrieve information in the single line that this model suggests.

[202] Memory is also central to Bergson, who argues that to understand a language, knowledge of that language is required. This knowledge is only a memory, so memory must be involved in the present experience of listening to a speech act. (Bergson, 1908, p. 109).

I will focus on retentions, as they are more relevant to the Present Moment. Husserl believes that this link between the present and the (immediate) past is continuously being added to. This means that at any time, past perceptions are being shoved backwards into memory. Memory is an active, not a passive, process. I am not only aware of the Present Moment, but some part of my mind/brain is processing present and past contents and pushing them backwards into my memory.

Dainton (2000) thinks Husserl fails to develop retentions in a useful way. 'Husserl tells us what retention is not, and what it does, but provides no explanation as to how it accomplishes this' (Dainton, 2000, p. 156). Husserl claims that retentions are not reproductive; they do not present a ghost image of a non-present entity. But he does take them to be originary; equivalent to primary impressions. As Rodemeyer (2006) points out, retentions are not reproductive but are perceptions, or intentions, of an object. Retentions 'do not belong to retention as retention but to perception' (Husserl, 1893 – 1917, p. 33).

Husserl also took retentions to be constitutive of temporal experience, rather than just a phenomenal content.

> This constitution is a unifying, a bringing together of the
> flowing stream of sensations as the objects and meanings
> experienced by me.
>
> (Rodemeyer, 2006, p. 80)

It is through retention that Husserl thinks we constitute the 'now'. 'Retention constitutes the living horizon of the now' (Husserl, 1893 – 1917, p. 45).

> The simultaneity of a colour and of a tone, for example – their
> being in an "actually present now" – originally becomes
> constituted with the primal sensations that introduce the
> retentional process.
>
> (Husserl, 1893 – 1917, p. 83)

Retention works through double intentionality; we can be aware of a stream of experiences both *as a dynamic stream* and *as a constituted simultaneous whole*. Retentions are central to the constitution of primary impressions, or the Present Moment.

Present perceptions and retentions are tied into the Present Moment. Husserl also thinks the future is central to temporal experience. To understand the lived experience, both of the past and the present, we must have an informed picture of the future. Every act that we have undertaken *was* undertaken with some future goal in mind. This goal motivates our action, and any present action is only possible because of past actions. According to Husserl, a phenomenological picture of the fact that I am typing and not listening to music requires an understanding of the goal at which I have aimed. That I wish to graduate has motivated me to not listen to music, but to type. I am typing *now* because I have undertaken certain past actions, of doing research, of attending lectures and so on. The fact that I seem to have a goal can be explained by a momentary act from which I sort out past actions, future possible actions and presently required actions; the past and future act as informants to the act of consciousness.

Husserl's concept of protention, Brough and Blattner (2006) point out, is more than expectation; protention is a phenomenological component of the 'now' that opens up 'further experiences, usually of what I am presently experiencing' (Brough & Blattner, 2006, p. 129). This does not involve running through possibilities of future experiences as if they were present. Rather, we presently experience future possibilities. Rodemeyer (2006) talks of this in terms of being drawn into the world. Without being attracted to objects and events we have yet to experience we would have no motivations to deal with the world.

> [The] "now-moment" must extend forward beyond itself, for
> if it did not, we would always be "satisfied" with what was
> momentarily actual and would never strive for—and thus
> would never have—experiences of whole objects and
> complete situations.
>
> <div align="right">(Rodemeyer, 2006, p. 134)</div>

The future does not just involve expectations; we are phenomenological drawn beyond the Present Moment to an open future by the phenomenological structure of the Present Moment[203]. Zahavi (2003) takes Husserl to unthematically show that we always 'anticipate that which is about to happen' (Zahavi, 2003, p. 83). This is demonstrated through surprise; we would be surprised if when typing a thesis the computer screen melted, for example. Surprise only makes sense in light of expectation.

Dainton thinks that Husserl's theory is committed to the atomistic view of the Present Moment, but Dainton is mistaken. Dainton believes that within Husserl's theory 'momentary awareness constitutes a distinct episode of experiencing in its own right' (Dainton, 2001, p. 102). This entails that 'each awareness is entirely isolated from its immediate neighbours' (Dainton, 2001, p. 102). But Husserl explicitly rejects this. Husserl thinks the Present Moment is an abstracted entity used for the purpose of analysis. It is part of a continuum and can only exist within that continuum. Husserl rejects the atomistic view; he thinks experiences are buried *in* a continuum, and such a view is not atomistic[204].

Husserl's theory meets the two criteria set for our phenomenological study. It is accurate; it explains our experience. It also gives us the tools to explain the phenomenology. Phenomenologically the Present Moment is an incredibly complex and rich event; it is an amalgamation of memories, expectations events and present experiences. To account for the phenomenology here we require the distinction between the act and the contents of consciousness. Husserl invokes the act/content distinction and by doing this he gives us the central tool for explaining the phenomenology of the Present Moment.

8.   *Consequences for Epistemic Time*

I have set out two theories and expressed a preference for Husserl's. Husserl gives us the tools to explain the phenomenology and also explains our experience. In the busy student, I type words onto a screen and this involves memories of past thoughts and intentions of future actions, or anticipations of them. If this is true about our experiences of time, then we should conclude that this experience is largely mind-dependent.

In the busy student, I am sitting typing my thesis. This is done in a context of memories of past inclinations/intentions, present perceptions and expectations about the future. This is part of my experience, and it makes little sense to think the entire experience is mind-independent. Rather the intentions, memories etc., should count as mind-dependent. Certain features, our perception etc., whilst mind-dependent, requires a single moment to attach to the world in some way. However, our

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[203] Whether that future is itself open, as in theories such as the growing block theory of time, is not our concern here. Merely that the phenomenological future plays a central role in the phenomenology of the Present Moment. Whether that phenomenology of the future entails an ontological thesis is beyond the scope of my discussion here.

[204] See Gallagher and Varela, 2003, for an interpretation of Husserl within Cognitive Science. Gallagher and Varela think that present sensory stimuli are tied in at the cognitive level with retentions of past stimuli. Without protention we have no agency and self-movement. See especially pp. 122 - 124.

experiences of listening to music suggest that our experience reaches beyond that moment, into the past and this suggests that parts of this experience are also mind-dependent.

We might claim that we do have a reason to expect there to be an Ontic version of the Present Moment. We clearly experience time as having a Present Moment. However, the guide for this moment should come from science. Science does not require the existence of such a moment, indeed, SR works perfectly well without one. Even if we do not require *the* Present Moment to exist as a universe-wide phenomenon, since SR does not allow for that, we still could claim that there exists *a* Present Moment. But we would have no reason to suppose that this moment is a localised ontological event, beyond our experiences being restricted to the here and the now. If there was something beyond this then our science ought to at least mention it. SR does not mention some privileged moment in time, so we have no reason to expect there to be one, independent of our experience.

The only reason we have to posit an Ontic version of the Present Moment is that our experience is of time *having* such a privileged moment. This is no guide, I believe, for our experience cannot be of the ontology of the Present Moment, for our experience involves memories and expectations and so on. These experiences are not easily mapped onto ontology, and we have no such reason to think that the Present Moment has an ontological version.

Given this, we ought to accept the Present Moment as a feature of Epistemic Time alone. The Present Moment structures our experience and we project that experience onto a world with no such privileged moment[205]. This is why our experience of time is so different to our understanding of time. Our experience has been structurally composed into the past, present and future, our understanding has not.

9.   *Conclusion*

I have set out the phenomenology of the Present Moment, focusing on the Busy Student. The phenomenology suggested that there are features of our experience which support a mind-dependency thesis. I moved to a more theoretic analysis to look at two theories purporting to provide a mind-dependent mechanism to explain the phenomenology. I preferred Husserl's tripartite view over Dainton's. The features of the phenomenology of the Present Moment that should be taken as mind-dependent, are intentions, memories, expectations, etc. This is uncontroversial.

In the following chapter I turn to look at flow; first the phenomenology of flow, then what it *is* to flow, and whether there is direction involved in that flow. We can hold that there is a flow in the world, without there being a flow of time. But if that flow is temporally directed, one suspects that the flow is a flow of time. I will argue that the flow, and subsequent direction, are the results of being *in* time, not brought about by the flow *of* time. But this flow is constituted around the Present Moment.

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[205] Nerlich notes that we tend accept facts about the structure of our perception of time to be facts about the ontic structure of time, notably the past, present and future (Nerlich, 1998, p. 130).

1.   *Introduction*

Having set out the phenomenology of duration, succession and the Present Moment, I turn here to analyse the last aspect of the lived experience of time. I will group the Present Moment, duration and succession together and call their collective experience the 'flow of time'. This flow seems to 'move' in one particular direction, and we need a clear account of what this experience is, and what conclusions we can draw from this. Time seems to move, where one moment occurs after another, and moves in a particular direction. Dainton thinks the experience of the flow of time is not linked to memory, he thinks that were we to reverse our memories, time would still appear to flow as it does. I reject this claim and suggest that memory is central to our experience of the flow. I will also argue that certain aspects of the flow of time are mind-dependent, others less obviously so. That time flows, as in moves or changes, plays no part, as we saw, in Ontic Time. That this apparent 'flow' has a direction seems less obviously mind-dependent; we have reason to suppose that there is a direction involved in the apparent flow.

An interesting account of the flow of time that I will mention here but will not develop further is that of Mellor (1998). Mellor starts by claiming that our senses give us beliefs that it is 'now'; call these A-beliefs. We want our A-beliefs to be true, but A-beliefs change their truth-value; if we are to maintain true A-beliefs we constantly have to change them. 'These changes embody the psychological truth in the metaphysical falsehood that time flows' (Mellor, 1998, p. 66). This gives us the experience of time flowing. We then seem to mistake this as an experience of time *itself* flowing; when the flow really is the flow of changes in our A-beliefs.

To demonstrate how this works, Mellor sets out the following example. To successfully turn on the radio to hear the six o'clock news, three things must happen. First I must believe that the news is on at time T (6 o'clock). Second I must believe that it is *now* time T. This A-belief is made true by the B-fact that it is time T, and my belief that it is 6 o'clock is simultaneous to time T. This belief is acquired by perceiving a trusted clock that says it is 6 o'clock at time T, which causes me *at* T to believe that it is 6 o'clock. Third, this belief is acquired and lost. It is this acquisition and loss of A-beliefs that gives us the impression that time flows.

Changes in 'now'-beliefs also change other temporal beliefs, believing that it is now 6 o'clock means that I now believe that 5 o'clock is past. These changes in belief are brought about by our perception of clocks and other temporal indicators, such as an observation that a shop is open which tells us that the shop's opening is past. The flow of time is derived from our constantly changing A-beliefs; my belief that 6 o'clock is future changes to my belief that 6 o'clock is present and changes again to a belief that 6 o'clock is past.

Mellor's account focuses on beliefs and intentions and can be seen as a neo-phenomenological account of the flow of time. I wish however to stay within phenomenology so will leave his account, which I think both interesting and plausible. I think the phenomenology will support his account, but that flow is more than beliefs, though Mellor does not say that the flow just is a belief. He bases the experience of flow on perception, which I think largely correct.

2.   *The Phenomenology of The Flow of Time*

Return to the 'Noisy Car' example, this seems most appropriate for the analysis of flow. I set aside any distinction between flow and direction and just

develop an account of the experience of flow. The flow seems to encompass all aspects examined so far: duration, succession and the Present Moment.

I am sitting at a bench and I notice first that the street is quiet. I then notice that noise is starting to faintly appear. It is so faint that I cannot discern the direction from which it comes. The noise soon appears to be coming from my right and soon I can distinguish two types of noise: a car's engine and music. A red car enters the street and drives along the road, passes the bench where I sit and then leaves the street. The noise of the car gradually recedes until the street is quiet.

This is an event that occurs quite quickly, but even after the event we can develop a phenomenological picture of the flow of time. This event begins and ends, and also, as an event, recedes into the past. The event begins when I first notice noise building. There is a moment when the silence gets interrupted. This suggests both that the silence precedes the noise and the noise succeeds the silence. As the event progresses, the silence of the street falls into the back of my awareness, and I seem to focus on the movement and noise of the car. This suggests that my experience 'moves' in some way. The event moves, and so does my experience of the event.

My experience is in some sense restricted to one part of the event. I experience the quiet of the street, then the growth in noise and so on. I also experience the whole event *as* an event. The quiet, then noisy, then quiet street constitutes my experience. It is not that part of this experience is restricted to being experienced from a privileged part of that event; the entire experience is had from one particular moment of that event. My experience of the whole event seems to be obtained from one privileged moment. This 'flow' of time then seems to involve an event occurring in successive ways but experienced from one particular moment: where the event is experienced simultaneously.

A long tradition has been to describe this phenomenology in terms of a metaphor with a river: the river of time. For example, Smart (1949) sets out this analogy as to imagine standing on a bridge watching water, sticks, leaves etc., flow past us[206]. According to this metaphor, some things change, some things do not; the sticks etc., represent events and pass the bridge (the Present Moment) into the past. The banks remain the same, and could represent space and so on. The one particular moment from which we experience the world is the bridge, and so on. I just mention this to locate the phenomenological description in an analytical tradition.

Husserl thinks that simultaneity and succession are directly linked and this seems to be reflected in this picture.

> [Simultaneity] is nothing without temporal succession and
> temporal succession is nothing without simultaneity, and
> consequently simultaneity and temporal succession must
> become constituted correlatively and inseparably.
>
> (Husserl, 1893 – 1917, p. 82)

We can conceptually disentangle the two but this does not entail that existence itself can be separated into one or the other.

Also as the car drives down the street I recognise that the car itself, while it moves, remains the same. Even though succession and simultaneity seem intricately linked, duration also plays a key part of the experience. We cannot differentiate one moment from another. As the car passes the bench I cannot stop the experience and focus on that single moment. I do seem however to be able to treat that event as a single unity. At the conclusion of the car's passage along the street I see a natural difference between the silent street and the car's arrival; though I also see this natural

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[206] Smart, 1949, p. 483.

break at the start, when the car enters the street. But this sort of demarcation of the event as a unity seems to occur after it has concluded. So whilst duration is involved, succession and simultaneity seem more central to the experience.

The phenomenology is of the car moving and of time itself moving. The car enters the street, *then* the car passes the bench; I seem to experience these events as occurring one after the other. This seems to be a genuine experience, not one developed through theory to explain the phenomenology. Time itself seems to move in a similar fashion[207]. I experience the time when the car enters the street *before* the time when the car passes the bench. This seems natural, indeed necessary. The car moving passed the bench *has* to occur *after* the car has entered the street. I do not experience this direction as contingent, or merely a result of accident. Events occur in that temporal order because they *have* to[208].

There does seem to be a significant phenomenological difference between time and events however. Whilst the phenomenology is of time, in the guise of the Present Moment, moving forwards from the past into the future. Events phenomenologically appear to move from the future into the past; thus McTaggart's claim that the change in events was from being in the future to being in the past[209].

We have several key phenomenological features of our experience of the flow of time; it occurs in successive moments in a background which remains stable. The succession appears to have a direction, one we experience as necessary movement from the past into the future.

3. *Post Phenomenological Analysis*

We have a brief phenomenological picture of the flow of time; it is the movement of successive moments within an underlying duration. But how exactly is the event constituted? It has a beginning, which seems to move back as the event unfolds. By the end of the event, when the car leaves the road, that beginning has receded into the past. The quiet nature at the start of the event seems to have diminished somewhat as the recent noise of the car and the music coming from its stereo resound in my experience. My recent experience dominates that experience. I can however, as the event recedes further into the past, recall that the early stages were quiet; can recall the gradual increase in noise. As the event recedes, the silence of the street starts to dominate my experience. As such the event now appears to be faded somehow. It has moved backwards.

At the conclusion of the event I seem to be aware of that entire event, and am aware of how that event occurred; I remember the experience of the event in its original form. Husserl explains this in the following way.

> It begins and ends; and after it has ended, its whole duration-
> unity, the unity of the whole process in which it begins and
> ends, "recedes" into the ever more distant past. In this
> sinking back, I still "hold onto it," have it in "retention." And

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[207] On an intuitive level at least; theoretically the claim that time moves *like* cars move invites the criticisms that time moves relative to what? Our experience is, however of movement and movement *of* time. It does not follow that this is a genuine movement, but only an experience of movement.
[208] Some orders do seem to be reversible; e.g. a car appears on the right and moves to the left *could* have appeared on the left and moved right. In both cases however, it seems necessary that the car moves forward (or at least in the same direction) in time.
[209] It could be that events only appear to move but are stationary and time itself is moving. Alternatively time could be standing still and events moving. When we recall events there seem to be a change in direction; rather than events moving from the future to the past, they seem to move from the past into the future. Events become phenomenologically aligned with time, such that it is natural to think that the car entering the street occurred before the car passing the bench.

> as long as the retention lasts, the [event] has its own
> temporality; it is the same, its duration is the same.
>
> <div align="right">(Husserl, 1893 – 1917, p. 25)</div>

When that event has dropped out of direct perception we hold it as a primary remembrance, and intend it in its 'transverse' form[210]. We remember it in exactly the way that it occurred. But when thinking about that event we also think of the whole event, the start, the middle, where the car passed the bench and I recognised the tune, and the end, when it left the street and I was relieved that peace returned. I seem here to think of the entire event in a single thought. I intend it in its 'diagonal' form.

The event occurs so quickly that I tend to think of it all happening at once. I do not seem to have much time to separate the concepts involved in my experience from within the experience. The dominant experience involves the car moving along the street. This is the flow of the event. I seem to experience that event from one single moment, but that moment seems to flow forwards in time, whilst my experience of the event recedes into the past. As the car drives towards me along the road, the experience of it entering the street seems to be pushed back into my memory, or primary remembrance, in Husserl's terminology. This seems natural, or unsurprising. As I track the movement of the car with my ears I do not seem surprised that the quiet start of the event no longer dominates my awareness. My awareness moves with the event, and moves onwards when the event is over.

Husserl has an interesting take on this, developing his concept of an act of awareness.

> [What] we called "act" or "intentional experience" in the
> *Logical Investigations* is in every instance a flow in which a
> unity becomes constituted in immanent time (the judgment,
> the wish etc.), a unity that has its immanent duration and that
> may progress more or less rapidly. These unities, which
> become constituted in the absolute stream, exist in immanent
> time, which is *one*; and in this time the unities can be
> simultaneous or have durations of equal length.
>
> <div align="right">(Husserl, 1893 – 1917, p. 80, original emphasis)</div>

Husserl seems to suggest that the act itself is buried in the flow, and moves with that flow. This seems correct. As the car moves, my act of being aware of it, of judging it, of wishing it would go away, moves with it. "Hence the flow of consciousness obviously becomes constituted in consciousness as a unity too" (Husserl, 1893 – 1917, p. 85).

There seems to be a dynamism involved, a flow within our experience. That experience also seems to have a direction. The entry of the car occurred before the car passing the bench. As the car leaves the street the beginning of the event seems to move further back into my memory. So far I have spoken merely of flow, but that flow seems directed.

The beginning of the event recedes away as the Present Moment changes. A new Present Moment adds more distance between your present experiences and that beginning, so that beginning seems more vague. This too seems natural. I experience that beginning and every earlier moment as falling behind my current position, just as the entrance to the street falls behind the car as it drives along it. This direction seems natural and fits in with my past experiences. I remember the time before the arrival of the car and that too is moving into the deep distant past.

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[210] Recall from chapter 11 p. 137 that Husserl distinguishes two ways of intending a temporal object; if we intend it in its original form that is including the lived time in that intention then this is called 'transverse-intentionality'. If we construct it in ways that represent it as occurring simultaneously, then this is 'horizontal-intentionality'. See Husserl, 1893 – 1917, pp. 85 – 88.

If we do not critically engage with this experience of flow this direction seems more than natural; it seems necessary. Unreflectively our experience seems to be of a necessary direction. That the car *had to* be at the start of the road before arriving at the bench could not in anyway be altered. This apparent necessity is a feature of our experience that I think we should quarantine and consider to be undecided. We could, following Kripke (1980), take this necessity to be empirical necessity; where the universe *could* have been set up in different ways but was not. Given the universe we *are* in, the direction of time is necessarily directed from the past to future. Or we could, following Price (1997), argue that the direction of time is entirely contingent. We could, following Kant (1781), think that all aspects of time are necessary, so *has* to go from the past to the future. The point here though is that our experience seems to be that time has a necessary direction. How resilient that necessity is, in the face of the science of chapter 5 is another question. I think reflection on experience weakens our reliance upon it as a guide to the direction of time. I do not wish to develop this further just note and quarantine it, and move on.

My experience is of a flow of time; it has a Present Moment which moves from the past into the future and does this against a background of an underlying duration. One explanation for this movement, and the awareness of it, is that the information passes into memory. When I compare present perceptions with past perceptions, the present perceptions are more vivid because they are occurring in a direct way, whereas the past perceptions are merely memories. Dainton rejects this, thinking that memory plays no role in the phenomenal flow of time.

4.   *Dainton's Reversal of the Phenomenological Arrow*

Dainton (2001) poses a thought experiment that he thinks shows that memory plays no part in the phenomenology of direction; call this 'Dainton's fantasy'. He thinks experience of direction is independent of memories. When our memories run opposite to our experience, time still flows in the direction of experience. I think Dainton is incorrect, and that direction relies on our memories.

Suppose that you wake up one day and can only hazard a very rough guess about what you were doing the night before, but you know with certainty what you are about to do. You seem to possess detailed and, you discover, accurate knowledge about what is about to happen to you. You have the breakfast that you knew you would have, your journey to work was exactly the way that you "remembered" it to be and so on[211]. Our new experience is like our current experience of watching a video of a favourite and much watched film. We "remember" exactly what will occur at certain moments in the film, even though we have yet to experience them[212]. You learn that these future orientated "memories" are as reliable as ordinary memories.

Despite this reversal, Dainton argues that the nature of your experiences remains essentially the same. 'The direction of immanent flow remains future-directed' (Dainton, 2001, p. 106). Your personal present will flow, in Dainton's terminology, towards the future. According to Dainton, this direction is an intrinsic feature of experience, not of memory. It is a direction of experience, which can be differentiated from memory.

5.   *Problems with Dainton's Account*

The example employed by Dainton does not do the work he thinks it does; the thought experiment is under-developed and several errors have crept in. I shall

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[211] I follow Dainton here in placing forward facing "memories" in scare quotes to distinguish them from the normal use of the term.
[212] See Dainton, 2001, p. 338, footnote 7 (chapter 7).

raise three general charges against Dainton; (1) his conception of learning does not fit with his experiment; (2) a reversal in memory would entail a reversal in the phenomenological direction of time; and (3), Dainton's experiment relies on memories so he cannot dismiss them.

There are two respects in which Dainton's fantasy is underdeveloped. First he needs to deal with causation; as we shall see Dainton faces a dilemma brought about by claiming either that causation is reversed or that it is not reversed. If causation is reversed then we have a problem with learning. If it is not reversed then we have a problem with the construction of "memories". Second, under Dainton's fantasy, the past is a blank canvas, whereas in normal life the future plays a significant role in our lived experience. Expectation, or pretension, in Husserl's terminology, is a significant aspect of our experience, so need to be reversed as well. To show why these problems arise we need to complete his experiment.

6.   *Reworking the Thought Experiment*

In Dainton's fantasy, one day I wake up to discover I have accurate future directed "memories" about what I *will* be doing. Call this day, 'Day 1'. These "memories" are more accurate the closer they are to Day 1. The further into the future I go, the less reliable are my "memories". I can only guess about what is in my past. Did I get up and have breakfast? Did I go to the gym and so on. The further into the past I delve the less sure are my guesses. So far this reversal works as Dainton thinks it does.

On Day 1 I wake up to find that my experience has suddenly changed from the familiar one where I can only guess about the future and remember the past to the unfamiliar one where I am only able to guess about the past but "remember" the future. Yet, as constructed by Dainton, from that moment onwards, I seem to be able to remember the past *and* the future. Dainton argues that

> [You] learn that these future-orientated "memories" are just as
> reliable as their past-orientated counterparts: what you
> "remember" happening does happen.
>
> (Dainton, 2001, p. 106)

On Day 2, I remember day 1, *and* "remember" day 3, 4… and so on. This is a mistake. If we wake up to find the direction of our memories reversed in the way that Dainton wants, then this reversal should be consistent with our normal experience.

If we are to reverse our normal experience, we cannot alter it in any way, except a complete reversal of our actual experience. In ordinary experience, I distinctly remember the near past; have fainter and less reliable memories of the more distant past, and vague memories of the distant past. I have a few insights into what happens in the future. I expect that the Sun will rise tomorrow, that I will need to eat food and so on. I have less precise expectations about actions further into the future. Will I go to the gym in a month? In a year? Will I be in Australia in four years? The further into the future I delve, the less reliant I am upon these expectations. This is the normal situation. We know about the past and guess about the future. This is what we need to reverse.

Let's apply this completed fantasy to the 'Noisy Car'. I sit at the bench "remembering" the car that will appear and drive from my right to my left, with the ensuing growth in noise etc. As the car appears and moves along the road I *forget* about its previous positions. I forget that it arrived on my right and disrupted the peace of the street. All I "know" is that the car is *now* in front of me and will drive

off to the left, shortly after which the street goes quiet[213]. Once the car has disappeared I forget about its existence.

This is the reversal that Dainton needed to describe, a complete reversal of the normal situation. However, Dainton adds the further claim that our future-directed "memories" are as reliable as our past-directed memories. I turn to look at this claim and show it to be false.

7. *The Problem of Learning*

This problem arises in two ways: First in learning *that*, i.e. learning that a car is about to enter a street. The second problem arises when we learn *how* to do some task, to ride a bike, for example. Both are problems for Dainton's fantasy[214]. Both involve causation and prove problematic if we stick with the claim that causation is reversed, giving us "causes".

Learning That

To turn first to learning *that*. In constructing his fantasy, Dainton claims that after day 1, we learn that future directed "memories" are as reliable as my more familiar backward facing memories[215]. This claim relies on our normally directed memories being as reliable as they are in the real situation. But in the reconstructed fantasy backward facing memories are no longer reliable. As such we could not learn to rely on these new "memories". We learn by remembering our experiences. In Dainton's fantasy we could not learn *that* these future "memories" are reliable, because once I realise that these "memories" are reliable, that "knowledge" passes into the past, and I can only "guess" about what I was thinking[216]. Consider my "knowledge" that the car is about to enter the street. As it drives along the street the fact that I "knew" the car would do this is forgotten. That "knowledge" is now in the past. If so, any realisation that these future directed "memories" are reliable gets forgotten when that realisation becomes past. So in these cases I have not learned at all. Because we forget the past we cannot learn in the traditional sense. We learn by doing things, remembering them, adapting behaviours and so on. But if we forget the past, then how can we learn at all? We could not learn that future-directed "memories" are as reliable as past directed ones.

One possible way to construct learning here is to think of keeping a diary. I note on 30th September that I "remember" that on the 1st of October I have a particularly good cup of coffee. On the 1st I note that I had a particularly good cup of coffee. Then on subsequent dates I can see that my "memory" on the 30th was accurate.

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[213] In this situation I would probably be able to "guess" that the car *has* driven up the road etc. But once the car is out of my perceptual range this "guess" would be highly speculative.

[214] The distinction between learning 'that' and learning 'how' can be examined by looking at amnesia. In some cases of amnesia, the amnesiac learns how to solve puzzles without remembering. The amnesiac is asked to complete a puzzle, and states that he has never seen the puzzle before. Later, he is again given the puzzle and again he claims not to have encountered the puzzle. But he completes the puzzle in a shorter period of time. The same goes with learning to play piano etc. The amnesiac is clearly developing skills to deal with solving problems. The distinction comes into play when we saw that the amnesiac has learnt how to do something, but he has not learnt that he has this ability.

[215] Dainton, 2001, p. 106.

[216] Since "guess" here refers to normally directed memories, my use of it reflects Dainton's alteration of "knowledge" etc., as future directed. In the normal situation I guess about the future, but know about the past (assuming that memories count as knowledge). In the fantasy version, I "know" about the future but can only "guess" about the past.

This mechanical route seems plausible, but there is a problem with it. I can note that my diary entries are reliable, but I then forget that those entries are trustworthy. It is only when I look at the diary that I note the accuracy of my future "memories". In such cases I cannot be said to know that my future "memories" are reliable. We do not say that a person knows the speed of light because he has to look it up every time he is asked. So the diary route is denied, for it distorts what we mean by "know".

A second route seems more promising; the accuracy of "memories" of future "memories" reflects normal reliance upon past-directed memories to accurately assess past memories. I remember that yesterday I remembered about a nice cup of coffee I had last week, and so on. But this promise is undermined because inherent in what it is to learn is that we "know" facts. In the normal world we claim that we know our memory to be reliable. In Dainton's fantasy, we cannot be said to "know" that our future "memories" are reliable, for even though we can "remember" future "memories" of even more future events, when those events occur, we forget them. But to know is not to forget. This second situation requires that we forget and this distorts what it is to 'know'.

Learning *that* is a problem but we might be able to develop a response here on Dainton's behalf. Future directed "learning" involves relying on near future "memories" of later "memories" of even later events. I can rely on my "memory" that in two years I attend a conference in Malaysia, because I have a constant "memory" of it from now up until that event; I "remember" a "memory" I have in a year of that event. When this event moves into the past, I no longer remember it, but for two years I had a reliable "memory" of a future event. Talk here is of reliability, not of knowledge. So we can be said to rely on "memories". As a possible response this seems unsatisfactory for it distorts what it is to know. Knowledge reduces to reliability, when we would wish our knowledge to be certain.

We could argue that this requirement for certainty cannot be met for normal knowledge, and all we can get is reliability etc. To require it of "memories", not memories, seems arbitrary. This is where we can bring in the dilemma about causation. Under Dainton's fantasy, he is quiet about whether causation gets reversed. Assume first that it does. If causation gets reversed then "memories" are the causal effects of future events. This would entail a movement of events from the future to the past, in a more significant way than the phenomenology suggests. We normally take WWI to be a cause of WWII, but this order gets reversed; WWII becomes the "cause" of WWI. My attendance of a conference in Malaysia in two years "causes" my submission of a PhD thesis. Theoretically this seems problematic, since such a reversal would alter the entire universe, not just our phenomenology. If so, then it is not obvious that the direction of time would flow from the past to the future still, but more from the future to the past. We have "memories" being "caused" by events in the future. As we shall see in section 8, this type of reasoning tends to support the claim that time would appear to flow in the opposite direction. More "recent" "causes" would bring about stronger "memories" thus giving the impression that the universe is somehow more real the nearer it is to the present, and the less real the further it is into the future. Time then would appear to be directed from the future to the past. Something Dainton would be keen to avoid.

Now assume that the direction of causation does not get reversed. This completely distorts "memories", in such a way that we might think that they were not a true reversal of memories. Normal memories are, at an intuitive level at least, causally bound to the events (whether they be mind-dependent such as fears/hopes, or mind-independent, such as cars driving down streets) they are memories of. But there is no causal link between the Malaysian conference and my "memory" of that

event. If so, then a claim that causation is not reversed distorts Dainton's fantasy and needs to be rejected. This points towards complications brought out by a thought experiment that is somewhat under-developed.

Learning How

Having looked at some problems with learning *that*, I turn here to look at learning *how*. Consider learning to parachute out of a plane. In our normal world, we learn how to parachute by being shown how, by practising, being trained and so on. Could we "learn" how to parachute in Dainton's fantasy? Suppose that I "remember" in the future going on a parachute jump. Would I now be comfortable jumping out of a plane because at some future point I "learn" how to do such things and survive?

One response here is to say that since we have a direct link to that future moment, we might be able to say we do "know" how to parachute jump. This relies upon the direction of causation being reversed; i.e. the event of "learning" how to parachute jump in the future "causes" us now to "know" how to parachute jump. Two thoughts need to be developed here, one specifically relevant to learning *how*, the other more general. First, learning *how* involves training the body, not just the mind/brain. Second, learning is a causal process. Learning how to do X is causally brought about. These thoughts show Dainton's fantasy to be even more complicated and one that needs further work.

First, when we learn how to do things like jump out of planes, we train our bodies to react instinctively to certain situations. We learn how to manoeuvre in the air, how to work the controls of the parachute and so on. Merely "remembering" these techniques is not enough to show that we can learn *how* to jump out of planes.

One possible response here is to say that we train our bodies in the past, and thus can learn *how*. But this does not work, for if we train our bodies in the past, we have "forgotten" this, even if we still have the physical programming to support the claim that we can move our bodies in the required way as if by instinct; we only have our "memories" that we "learn" at some future time to jump out of planes. I would not jump out of a plane on the *assumption* that I had trained my body such that my "memories" could trigger instinctive reactions in my body[217].

Learning *how* becomes bizarre in Dainton's fantasy; it requires that we do things now on the basis of "learning" how in the future. But we have no reason to suppose that we can do these things even though we "remember" learning them at some future point.

Implicit to both learning *that* and learning *how* is a causal process, from the lesson of learning to the moment of "remembering". Our ability to parachute is caused by training and so on. In Dainton's fantasy, though, we seem to be committed to backwards causation. I "learn" that I travel to Malaysia in two years and this is causally brought about by my travelling to Malaysia in two years. Some future event brings about, causes, a present event, my "memory" of that event.

I have looked at two learning-based problems for Dainton's fantasy. They point towards the need to fully, clearly and consistently work out thought experiments. I will show that Dainton's failure to do this gave him the conclusion he wanted. Fully working out the fantasy shows that reversing "memories" entails the reversal of the phenomenology of direction.

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[217] One further possible response is that since I "remember" the entire parachute jump, I "know" what to do and when to do it. I "know" that a few minutes into freefall I "will" pull the parachute release cord. When I reach that moment I pull the cord. This still does not explain *how* I knew to pull the cord at that time, I only "remember" doing it, not *learning how* to do it.

8.   *The Flow of Time in the Reworked Thought Experiment*

I turn now to my second objection; Dainton's fantasy does not support his conclusion. On Day 1, I wake up and have vivid and reliable "memories" but vague anticipations and "guesses" about memories. This scenario does not support Dainton's claim that direction would still flow from the past and into the future. I will conclude that the direction of time would flow from the future into the past.

Our "memories" work from the future into the past, and there are two possible ways to describe the order in which we would "remember" events: first we "remember" events in the order that they occur. When I sit at the bench "knowing" that a car is about to appear on my right, I "remember" the car appears first on my right *and then* moves to my left: although my "memories" of the future are reversed, the order of events as they appear in those "memories" remains the same.

In the second possible way, the order in which I "remember" events runs contrary to the order of the events being "remembered". I sit at the bench and "remember" the car first appearing on my left (not my right as before), *and then* reversing towards my right before reversing around the corner onto another street. I hear the tune of its stereo played backwards and so on. Not only are my "memories" reversed, so too are the order of events as they are "remembered".

Dainton is silent about which interpretation to adopt, but it is crucial to his case that we adopt the first one. The second one bars his conclusion, for time appears to flow from the future into the past and this is not the conclusion he wants. I will adopt the first reading to develop Dainton's thought. If we distinguish between "memories" and experience the first interpretation is the more natural reading. We "remember" the order of events as they occur, but these "memories" themselves are reversed. Consider the car, about to appear on my right. I "remember" the car first arriving on my right and then moving forward in the normal direction on to my left. My "memory" here is of the movement of the car in time from the past to the future, even though my "memories" themselves move from the future to the past. But, it turns out, this interpretation leads to phenomenological incoherence; the 'strength' of a memory turns out to not reflect the recent status of the event remembered.

The phenomenological incoherence can be brought out by distinguishing between

> A. The order of events within one moment of time; caught in one item of memory. I remember the street is empty then the car moves into it and this order is captured as one item in my memory.
> B. The order in which memories are stored. My memory of the car moving into the street is stored before my memory of the car passing the bench.

According to (A) each item of memory involves not only the memory of events but also the memory of events as being before or after other events. Each item of memory records direction. It is in (B) that most of the interesting thoughts arise. We can further distinguish between

> a. The order that those "memories" were acquired.
> b. The order that those "memories" are accessed.
> c. The order of those "memories" in terms of their vividness and fading etc.
> d. The order within a chunk of "memory" (i.e. within what happens whenever the "memory" is accessed.

With normal memories, those events that occur first are acquired, thus stored first. These memories can be accessed in any order. I may remember entering the street and then sitting at the bench. I can also remember sitting at the bench and *then* remember that I first entered the street, and so on. Access can be in any order, or

random: my just sitting at the bench. The point that is of interest is c., where the phenomenology of my memories of entering the street are less vivid than my memories of sitting at the bench, and less vivid still than those memories just acquired of the car driving passed. Those memories of entering the street have been in my mind for the longer period. Suppose we were to place these memories in a chain from my present experience through to the memory furthest from that present experience; the events that are stored at the earliest time possible and I am still able to remember. In a chain between this memory of events and my present experiences, those events that were stored first, are furthest away and the least vivid. We might represent this as follows:

Present Experience   Most Distant Memory

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

The phenomenological impression of event X is more clear and vivid the closer it is to our present experience. The further away it is the less vivid and more opaque.

However, if "memories" are stored in the order of the occurrence of events then the phenomenology gets a little distorted. The longer a "memory" has been in the cognitive system the less vivid and more opaque it is. Since under Dainton's fantasy our "memories" go from being in the far future to the near future and to the present *and* under this first reading the "memories" are stored in the order of events, the "memories" closest to our present experience have been in the cognitive system the longest so are the least vivid. We could represent this as follows.

Present Experience   Most Distant "Memory"

XX XXXXXXXXXXXXXXXXXXX**XXXXXXXXX**

But the phenomenology here gets significantly distorted. My present experience is phenomenologically rich; I hear music, see colours, smell and so on. Then the nearest "memory", of what happens next, is extremely vague, I only just "remember" it, since it has been in my "memory" the longest (after present perceptions). Yet events further into the future are more vivid, and more clearly "remembered", since they have only just been added to my "memory". Whilst sitting at the bench I see the car, hear the music, then have a vague "memory" of it being just to the right of the bench, and the further away that car is, the more vivid my "memories" become. My "memory" of the car entering the street is almost as vivid as my present experience, yet it is temporally quite far away.

It may seem that this reading gives Dainton the conclusion he wants; time would still *appear* to move forwards, even if our memories were reversed; were in fact "memories". However, to achieve this result the phenomenology has been so significantly distorted that I believe Dainton would reject this reading. He explicitly claims that 'the character of your experience remains essentially the same' (Dainton, 2000, p. 106). Our normal phenomenological experience of memories is of a gradually loss of vividness of memories as they fade into distant memory. Under Dainton's fantasy this is not the case; vividness jumps around.

We should reject the first reading of how "memories" are stored. The above troubles came about because I stuck with the claim that we "remember" events as occurring in the temporal order that they did occur. But this leads to incoherence. Let us turn to the second construction of the order of "memories", where events are recalled in reverse. Instead of remembering the car entering the street at point A and driving forwards to point G, I remember the car entering the street at point H, reversing along the road up to point A where it disappears.

We still need to ask in what order events are acquired. If time moves forward as in our normal experiences, then our "memories" ought to be acquired in the same

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order. But we "remember" those events as occurring in reverse. We acquire a "memory" of the car entering the street driving forwards at A, *before* we acquire our "memory" of the car passing the bench at G. But we "remember" the car being at G first, and then the car reversing along the street towards to point A. This does not seem right, so we need to reject the claim that we acquire our "memories" in the order that they occur. Leaving us with the claim that we acquire "memories" of events in the reverse direction. We can still access these "memories" in any order we wish. The order of vividness now follows the order of acquisition.

The trouble here is that the conclusion about the phenomenology of direction contradicts Dainton. My sequence of "memories" is of the car being on the left and then reversing towards the right. As these "memories" come closer to my present experience they grow in intensity. Dainton wants to conclude that the car seems to fade into the future, thus showing that our experience is of time moving into the future even though our "memories" move from the future into the past, but this conclusion does not follow. My "memories" are of a car reversing from point G to point F up to point A. When the car is at point G, my "memory" of the car as being at point A is further into the future, so less clear than my "memory" of it as being at point F. It seems that vividness seems to grow from the future into the present. This gives the impression that time flows from the future into the past. Exactly the conclusion Dainton wishes to avoid. We can again represent this as follows.

Present Experience   Most Distant "Memory"
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

This means that Dainton cannot accept the second possible interpretation of the ordering of "memories". "Memories" cannot be stored from the future into the past, they have to be ordered and acquired as they occur in the world. We saw that this was an incoherent position. This means that according to these two strategies, either Dainton's fantasy is incoherent, or it supports the conclusion Dainton wanted to avoid.

There are two further ways that time could be directed in our "memories", but I believe that Dainton would not accept either. This involves chunks of memory, obtained in a specious present. The specious present contains an experienced order of time; there is a temporal order within that chunk of experience. This transfers to memories, and "memories". There seem to be two options available here. First, I have a "memory chunk" where the order of events follows the normal direction. Second, I have a "memory chunk" where the order of events follows the reverse direction. In the first case, since my "memory chunk" involves time moving forward I would still have the impression that time flows forwards. In the second case, time would appear to flow backwards, and Dainton would reject this, since he thinks the presence of "memories" would still involve the normal direction of time. The first case seems his best bet.

In the first case the temporal direction is normal and that direction is involved in chunks. Even though our memories are reversed, the phenomenological direction of time is not. What does the causal dilemma bring out of this claim? A reversal of the direction of causation suggests that "causation" plays little or no role in the direction of time. Whilst we might not tie the direction of time directly *into* the direction of causation, we still suspect that causation is *part* of the story. If the order of causation is reversed, then the order of time is causally brought about by, or linked to, the order of "causation" but runs in the opposite direction. This is strange to say the least. To suppose that the direction of "causation" runs opposite to the direction of time, i.e. something it plays a "causal" role in, requires a very strange ontology.

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Suppose now that the direction of causation is not reversed. We normally think that causes play a role in our memories; a memory is a cognitive effect of some cause, whether it be mind-dependent or mind-independent. However, if we have causes *and* "memories" then causation plays a strange role at a cognitive level. Causes have little or no effect on past experiences, since they bring about no memories, just guesses. As causation runs on the normal direction, but we have no memory traces of them, then causation plays no role in our cognition. This is strange.

Causation, under Dainton's fantasy, plays no role in our "memories" and we might think this a failure to construct "memories" as identical analogies of memories. It turns out that causation entails that "memories" have no causal explanation; my trip to Malaysia does not cause my "memory" of it. My trip to Malaysia has causal effects into the future, not into the past. Since this trip is in two years time it seems improbable that it could cause my "memories" of it now, since these "memories" are in the trip's past; being in the past, "memories" should be immune to the normal, future directed, causal effects of that trip. It seems to follow that "memories" have no causal connection to the world. If so then we have one less connection between our cognition and the world.

I do not want to say much more about this, but think these concerns sufficient to suggest that Dainton would be uncomfortable with both these alternatives. What we require is that the fantasy gets fully developed to deal with these issues.

9. *Expectation and Protention*

Having looked at problems brought out by a thought experiment left under-developed, I want to take a brief look at another area where that under-development proves problematic. Since Dainton did not reverse memories completely, he has failed to give an account of expectations, and as such has failed to reverse our entire phenomenological experience. In Dainton's fantasy the past seems to be an almost completely blank canvas and the future known through our "memories". He makes some mention of this, whereby within the fantasy we only have the 'haziest speculations' (Dainton, 2000, p. 106) of what occurred in the past. Yet in our normal experience we have more than the haziest speculations about what happens in the future. I do not have to guess that I will get out of bed tomorrow; if there is a day after today, I know I will get up. When I observe the car in motion I now experience that car as being at a place it has yet to reach, since my expectation completes the car's motion. A reversal of our phenomenological experience needs to provide an account of "expectations". As Dainton's fantasy stands, we can only guess about what has happened, but "expectations" I suggest, are stronger than mere guesses.

There *could* also be a problem with protension within the specious present. As we saw in chapter 12, the phenomenology of the Present Moment is highly suggestive of a specious present covering memories of the recent past, present perceptions and expectations about the immediate future, or protensions in Husserl's terminology. Given that a reversal of our phenomenological experience gives us "memories", we also require "protensions". However, "protensions" suffer the same problem with "causation" that broader "expectations" suffer[218]. Were we to have "causes" then our experience involves "protensions" not causally related to the world at all. So when I see a car drive down a street my "expectation" that it was at W

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[218] We can distinguish between expectations which are future-directed guesses, reliable belief and perhaps knowledge, and protensions which play the same role but are restricted to the specious present. The Present Moment, being slightly extended in time involves expectations of a very limited temporal nature, call these protensions. Expectations however, are not so restricted and can cover years, centuries and beyond.

before X has no "causal" basis in the movement of the car itself, since "causes" run from X to W. This suggests that the past *is* a complete blank. If so, then reversing the direction of causation entails that the reversal is phenomenologically inaccurate.

We could say that the "expectation" *is* brought about by the movement of the car from being at Z to being at X and so on. But if so, then our "expectation" seems built upon a reversal of the direction of time, and Dainton is keen to avoid this conclusion.

Were causes to remain normal, i.e. not "causes", then causation plays no role in experiences we have had, but does play a significant role in experiences we are yet to have. Again, this supports Dainton's claims, but also suggests significant theoretical problems for his case, as we saw above.

In Dainton's defence he could claim that he does allow for the specious present being reversed, since we learn that "memories" are just as reliable as memories[219]. Yet this claim either relies on an incomplete reversal of our phenomenological experience, or Dainton is inconsistent in his development of the thought experiment: the past is blank *and* the past is as open to memories as the future is to "memories". In either case we require more work to bolster his claims. As it stands, Dainton's fantasy does not support his conclusions and leaves certain areas significantly under-developed.

10.   *The Tacit Reintroduction of Memory*
I turn now to my third objection that, Dainton's fantasy relies on memory. This has already been implicit in the first and second charges: It is only because of memory that we could notice the direction of our experiences. Replace these past-directed memories with future-directed "memories" and Dainton's conclusion that direction is independent of memory is rejected.

Even if we "remember" the future in the way that Dainton wants, where experiences move from the past into the future as moving from the past to the future, direction as phenomenologically given *still relies upon memories*. I can only determine a direction of time *because I have* "memories" of the direction of my future experiences. I only "know" that at some later time the car appears on the right before it moves to my left because *I "remember"* that this is order of events. Even when our temporal experience is temporally extended, once that experience is over and forgotten any lessons available directly from that experience is lost. It is still memory or rather their reversed version, "memory" that plays the key role here. In other words, in the normal world our awareness of flow relies upon memories, whilst in Dainton's fantasy it still depends on "memories", the analogy of memories. The direction of time as phenomenologically experienced relies on the same cognitive feature: memory and "memory".

11.   *Rejection of Dainton's Fantasy*
Dainton's fantasy does not support either of his claims. He claims that memories are distinct from experience, but this claim is rejected because our knowledge of events, whether that knowledge be future directed or past directed, relies upon "memories" or memories. His second claim that reversing the direction of our memories does not entail a reversal in the direction of phenomenological time is not correct. If we reverse our memories then time would be phenomenologically reversed.

I have rejected Dainton's fantasy because he denies memory a role in our experience of the direction of time. Whilst this does suggest that memory is

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[219] Dainton, 2000, p. 106.

involved, it does not entail that the entire experience of direction is brought about by memory. I only suggest that there is a role, and Dainton's rejection of it is a weakness in his theory.

I prefer the Husserlian interpretation; where the dynamism and direction involved within our experience does rely on memory. We perceive an event, a perception that goes on to be held in memory as a primary remembrance; we remember it in exactly the way that it occurred. We also think of the whole event, the start, the middle, and the end. Our perception of an event, say a car driving down a street, seems to involve a flow, constituted by a flow forwards in time, whilst my experience is of events receding into the past. Awareness moves with the event, and moves onwards when the event finishes. According to Husserl, this flow is a unity constituted in immanent time[220]. Husserl thinks that the act of awareness is buried in the flow, and moves with that flow. The flow of consciousness is treated as a unity[221], and treated as a unity largely through memory. I turn now to develop the analogy with perception of colour and our experience of a flow of time.

12.   Analogies with Perception

The analogy between the mind-dependence of Epistemic Time and the mind-dependence of colour perception is less perfect when applied solely to direction, for direction does seem to be more like a 'primary' quality of our experience of time. However, the established mind-dependency of some features of duration, succession and notably the Present Moment show that, whilst imperfect, the analogy with perception of colour does give an insight into ways that Epistemic Time could be mind-dependent.

I intend here to focus on direction and suggest that we have little reason to take the majority of our experience to be mind-dependent. In 'the Noisy Car' we saw that the movement of our experience follows the movement of the car. Focusing solely on direction, we have little reason to think that our experience involves mind-dependence. The movement of the car involves an ontological object. Its movement is through a seemingly mind-independent spatial field; the car is in one position and then the next, and so on. This is movement of a mind-independent object through a mind-independent spatial field. This movement involves a direction, in space *and* in time. The car's movement suggests that it is in one position *before* the next; it was at the entrance of the street before it was at the bench and so on[222].

This involves a direction and one not easily sustained as being mind-dependent. My experience follows this pattern; I experience the car entering the street before I experience it at the bench and so on. Not much in this description suggests mind-dependency. As we saw in Chapter 5, we have no reason to suppose that this is a direction *of* time rather than a direction of things *in* time.

Here we have an analogy between Epistemic Time and the perception of colour. When we look at a visual field some of the features of that field are taken to be objective, such as shape, spatial position and so on; some of those features, such as colour, can be taken as mind-dependent, and also as mind-independent. Both positions need support, and many solutions have been proffered. Here I just turn to develop a brief analogy and little more.

Epistemic Time provides a temporal field. This field can be described as a flow. Some of the features of that field can be taken to be objective, such as objects and events occurring before, during and after other events (in B-language). Some of

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[220] Husserl, 1893 – 1917, p. 80.
[221] Husserl, 1893 – 1917, p. 85.
[222] We can couch this in A-ish or B-ish terms; the car is now at the bench, was at the entrance to the street and will be at the exit; the car at the street entrance is earlier than the car at the bench and so on.

those features, such as the apparent speed of succession, apparent length of duration and loading of the Present Moment, can be taken as mind-dependent. Cases can also be made for them being mind-independent. Both cases, if the analogy is to work, need support.

Husserl takes this flow to be mind-dependent.

> This flow is something we speak of *in conformity with what is constituted*, but it is not "something in objective time." It is *absolute subjectivity* and has the absolute properties of something to be designated *metaphorically* as "flow."
>
> (Husserl, 1893 – 1917, p. 79, original emphasis)

Epistemic Time is, I believe, mind-dependent in ways analogous to colours being mind-dependent.

The claim for mind-dependency is based on the argument from science. The argument from science used for colour as being mind-dependent goes as follows; we describe the universe in colourless terms, if so, then colour is not part of that mind-independent universe.

> Colour, sound, taste and smell …, play no part in the physicist's account of matter, although perception treats them as characteristics of physical objects.
>
> (Armstrong, 1961, p. 156)

Since science describes a colourless world the colour of our experience is mind-dependent. Analogously if many of the features of our temporal science are not included in the description of the universe, in terms of SR, then those features should, at least at a prima facie level be taken to be mind-dependent.

I have attempted here to lay out the perception of colour to be the analogy for our perception of time. It is a bare analogy, one drawn from the phenomenological analysis of the last three chapters. Certain features of our phenomenological experience of time suggest that they be taken as mind-dependent, and thus part of Epistemic Time; the length of films, and the speed of watching those films vary with the interest of the observer. The Present Moment is loaded with intentions, hopes etc., that cannot be mapped onto Ontic Time. The experience contains memories of the past, expectations of the future and present perceptions. None of these can easily be taken to be mind-independent.

13.   *Conclusion*

Here I have developed a phenomenology of the flow of time, with its associated direction. The flow is constituted by duration, succession, the Present Moment and direction. Key elements of our experience of this flow should be taken to be mind-dependent; the variation in speed and the spread of the Present Moment. This has fleshed out the analogy between Epistemic Time as mind-dependent, and the perception of colour as mind-dependent. The phenomenology has given us an insight into the lived experience of time.

Next I turn to explain why such subjective experiences seem to be universal. What we need is an account of the intersubjectivity of the phenomenology. To look at this I will turn to the work of Rodemeyer, but will prefer an explanation based on secondary qualities. I then compare Price's agency thesis to a version of projectivism to explain how exactly we mistake our experience of time to be of Ontic time, *not* Epistemic time.

Chapter 14
Perception, Perspectivalism and Projectionism

1. *Introduction*

I have developed a phenomenological study to flesh out the analogy between the perception of 'secondary qualities' and the experience of Epistemic Time. Two tasks remain. First we need a reason to suppose that the phenomenology developed does not commit us to solipsism, the view that there are no other minds/brains beyond our own consciousness[223]; second we need an account of how Epistemic Time operates as a mind-dependent phenomenon. If the phenomenology developed does commit us to solipsism then the account developed only applies to one person, not all. I shall favour an account of intersubjective time developed out of Husserl by Rodemeyer (2006). If Epistemic Time is intersubjective, then it is more than a solipsist mind-dependent phenomenon. If so, then we need an account of how we mistake Ontic Time for Epistemic Time. Here I will look at two approaches, a projectivist account based on Hume, and Huw Price's perspectival view.

2. *Intersubjective Time*

The phenomenological picture of time I have developed rests on the assumption that as an account it describes a general experience of time. This was done within phenomenology, and there is a suspicion that phenomenology commits us only to an account of our own experience. We cannot infer from our own experience that all experiences are similar; i.e. we see the same tomato as being the same colour red. If so, then the account I intend to develop fails; we want a theory that explains why *our* understanding of time is so different to *our* experience of time. Instead we would be left with an explanation of why *my* understanding is so different to *my* experience of time.

> [If] there is no discussion of [time] beyond its immanent
> constituting existence as related to me, then we cannot explain
> how all subjects experience the same "now" as now.
>
> (Rodemeyer, 2006, p. 45)

Rodemeyer (2006) develops a phenomenological account of time to overcome this by invoking a concept of 'world-time' used by Husserl but left undeveloped. To get to this 'world-time' Rodemeyer invokes intersubjective temporality. In effect, Rodemeyer proposes four levels of time: subjective, intersubjective, 'world-time' and objective time. Though these last two could be taken to be equivalent. Whilst her invocation of intersubjective time is commendable I believe this theory overly complex and will propose an alternative, based on ET_2.

3. *Intersubjective Temporality*

Rodemeyer follows Husserl in arguing that objective time gets constituted *through* subjective time. This gives us two levels of time, a purely subjective time, described in Husserlian terms, and a purely objective time; one we use clocks to count. We must have the experience of time before we can even think of counting that time using clocks.

What we now need is an account of how exactly we are in contact with that objective time. If we are restricted to immanent time, solipsism follows. This is where intersubjectivity comes into phenomenology. Rodemeyer starts with general phenomenological intersubjectivity. Focusing on the work of Zahavi (1996), she

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[223] I have left this criticism until now because whilst they do need to be addressed, it is better to address them to a fully worked out theory rather than as a general concern for phenomenology itself.

claims that we are in direct phenomenological contact with unperceived sides of buildings etc., because it is possible that someone else could be in direct perceptual contact with that side. Standing at the front of a house, with no view of the rear I can surmise that it is *possible* that I could be at the rear looking at that instead of the front. I infer from this that there are other sides of the house, beyond my present perceptual experiences. That we can have a present experience of a non-presently experience-able side of a building suggests that objects are there for every subject. When I look at the front of my house I cannot see the sides of it, nor the interior, nor the back. Yet I know *now* that these sides exist, even though I am not in direct access with them. If the house exists as an object then I know that it could be that someone is at the back of my house, in a similar situation, perceiving the back of the house, but not the front and so on. It follows, Rodemeyer thinks, that the house 'relates us to horizons that are intersubjective as well as subjective' (Rodemeyer. 2006, p. 52). It is part of the phenomenology of my experience of the house that the house acts as an intersubjective conduit with other people. Phenomenological solipsism is only the start of the phenomenological method.

As a first step this is somewhat unconvincing, since the presence of other objects to be experienced does not entail the presence of other minds/brains to experience that object. Zahavi (1996), however, thinks the important question is why these phenomenological horizons exist for our consciousness at all. They cannot exist because we have experienced them in the past, nor because it is *possible* that we could have a different perspective. That the house has one meaning for me implies that it also has meaning for others; a meaning that others are better placed to understand. My phenomenological experience of the front of the house 'indicates other subjects through apperception, by referring to other meanings beyond the absent sides of the object' (Rodemeyer, 2006, p. 51).

Rodemeyer distinguishes two forms of this argument, a weak and a strong one. In the weak form, we are linked to intersubjectivity by becoming aware that there are other sides to objects. The strong form takes intersubjectivity to be required *if my* experience is to occur at all. This second claim, Rodemeyer admits, is harder to substantiate[224]. However, she takes both to show that intersubjectivity seems to be given, seems to be open to experience in some way. Zahavi and Rodemeyer think that there may be two structures involved here, the intersubjective nature of the object, and the intersubjective nature of the consciousness that is open to that experience. Instead of proving the existence of other minds/brains, the intersubjective nature of phenomenological objects is one step on the way to other minds/brains.

The second step involves intersubjective time. We have immanent subjective time and work our way to objective time.

> [If] objective temporality is founded in inner time-consciousness, then the temporalizing consciousness of different individuals cannot be totally distinct: *They must connect in some way*—or else we would have *many* objective times.
>
> (Rodemeyer, 2006, p., 61, original emphasis)

That I can have an experience *now* acts as phenomenological evidence that another could be having that experience, *now*. Return to the example of the house. I experience the front, *now*, and this acts as an experience of the back *now* because were someone else at the rear, they would be experiencing that back of the house *now*. It follows, if this is accepted, that two people could experience the same *now*.

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[224] Rodemeyer, 2006, p. 52.

This is intersubjective time. It is the possibility of two different people having the same subjective experience. If this account is correct then intersubjective time acts as a link between objective time and conscious experience. Intersubjective time is mind-dependent, yet universal. We might take this thought and develop it a little to get a grip on what phenomenological evidence we have for the existence of intersubjective time.

Consider the phenomenology of listening to music. The existence of music can be taken as evidence not only for intersubjective time, but also for an intersubjective time described in Husserlian terms in ways Rodemeyer wants. As we saw in chapter 12, the phenomenology of listening to music involves more than merely the present; to experience the melody we need memories of previous parts of the song and anticipations of future developments. Other people listen to music. Indeed, other people play and create music. It seems quite reasonable for this to count as evidence that the Present Moment, involving retentions, perceptions and protentions counts as a universal, but subjective phenomenon: i.e. intersubjective. Here I experience a tune that has been created by someone else. Someone else has employed this phenomenological structure to create the music. If so then the existence of music points towards the existence of other minds/brains, and since we treat music as another type of object, this move rests on the intersubjective nature of objects in general.

Rodemeyer gives a viable account for the possibility that phenomenology delivers a description of one experience capable of being generalised to all experiences. World-time builds on this to show that our experiences of time, tie us deeply into other conscious minds/brains; they constitute in some way the nature of intersubjective time.

4.   *World-Time and Objective Time*

Rodemeyer argues that we cannot claim that conscious beings *are* connected to explain the mutual experience of objective time. Nor can we say we are connected *through* objective time since we require subjective time to constitute that objective time. This suggests 'that there is a *third* temporal structure that synthesises living presents in order to make the constitution of an "objective" present possible' (Rodemeyer, 2006, p. 63, original emphasis). World-time it turns out is the collection of all subjective experiences.

Rodemeyer thinks that world-time constitutes objective time. World-time is the operation of all conscious beings together to constitute an objective time. Individually we constitute objective time *through* subjective time. Were we to combine these subjective times, what we would have is a time constituted by the set of all conscious beings.

> [The] consciousness supporting world-time must be that of all
> subjects together, a communal type of consciousness—or as
> Husserl says, a "unity of mutual understanding."
>
> (Rodemeyer, 2006, p. 67)

Rodemeyer qualifies this in the following ways.

> World-time is the synthetic link of all temporalizing
> consciousnesses, making the world-present together. It links
> all living presencing, and it constitutes objective time.
>
> (Rodemeyer, 2006, p. 68)

If this is the case, then world-time is not objective in the sense of being mind-independent. Rather, world-time is objective in the sense that it is not entirely subjective. But nor is it also entirely objective.

This might be what we want for Epistemic Time. A mind-dependent universal phenomenon, which drops out of scientific accounts of the universe, if developed in a mind-independent manner. There are two ways to take this, a strong and a weak form. The strong form is untenable, but the weak form seems workable.

If we take a strong reading of Rodemeyer's theory there is a suspicion that conscious beings come together to constitute objective time; this suggests a causal link from all conscious beings to all other conscious beings.

> In order to co-constitute the world with others, consciousness
> must be able to reach outward toward other profiles, and
> toward the horizons of other meanings and consciousnesses.
> (Rodemeyer, 2006, p. 188)

This suggests that our consciousness has causal efficacy. Further

> Intersubjective temporality is the aspect of temporalizing
> consciousness that, structurally, reaches out for and maintains
> a connection between consciousness and other
> consciousness… It points to the structure of temporalizing
> consciousness as enabling an intersubjective link through its
> activity of constitution.
> (Rodemeyer, 2006, p. 191)

If the strong reading of Rodemeyer is true then she seems to be saying that the capability we have of constituting subjective time also affects other consciousness; my capacity to alter my experiences also has the capacity to alter someone else's experiences. If I see a film as passing quickly, then that should speed up my wife's experience. If this reading is correct then Rodemeyer's intersubjective theory becomes highly problematic. It posits a telepathic ability not justified by the phenomenology.

Zahavi (2003) thinks that criticisms of Husserl for thinking that consciousness has this causal power is mistaken. Constitution is not some causal power by which we create objectivity out of our subjective phenomenology. Rather constitution is how the objective world is presented as a fact to us. Even then it is not just presented to us.

> To speak of transcendental subjectivity as the constituting and
> meaning-giving entity and to speak of objects as being
> constituted by and dependent on subjectivity is formally to
> speak of the structure subjectivity-world as the transcendental
> framework within which objects can appear.
> (Zahavi, 2003, p. 74)

Constitutive acts are subjective organisations that enable us to have experiences of an objective world; these acts *do not cause* that objective world. Zahavi distinguishes two concepts of subjectivity in Husserl; first a narrow, abstract notion which suggests idealism; and second, a 'more concrete one that encompasses both consciousness and the world' (Zahavi, 2003, p. 74). This is the move to intersubjectivity and ultimately the life-world.

To apply this to world-time, we can start with Zahavi's focus on the intersubjective nature of all phenomenology, not just temporal phenomenology. Zahavi distinguishes between the role of an initial 'other' and all subsequent others. It is through our experience of this initial 'other' that we come to realise that the world is not just given for me, but given to all subjects. Here the objectivity of the world *is* constituted in some way by the subjective nature of some 'other'. An initial experience of an 'other' makes us realize that there is another consciousness in existence capable of viewing the world and this demonstrates that the world is objective and available for all. All subsequent others play a role that fulfils our

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picture of reality; these others demonstrate that the world is real, they do not constitute the reality of that world[225]. We could show that the awareness of an 'other', capable of experiencing time in ways significantly similar to our own, demonstrates that temporality, whilst mind-dependent, goes beyond the personal; it is intersubjective. There is no causal role here between subjects, just an initial, opening of our phenomenology to objective possibilities.

This leads us to the weak reading of Rodemeyer's theory. I agree a time to meet my wife at a cinema to see a film. By doing so, we set a time, which we can both recognise, *in the future* to meet. This means that there *will* be a moment when we meet; suggestive of at least two components of the phenomenology of the Present Moment. By coordinating our activities we synchronise our experiences of time. Thus when we meet, we have subjectively interpreted time in such a way as to *meet*. There is an objectively constituted moment in time through which we in some sense demonstrate to each other that we subjectively experience time in similar ways. So when we say that we constitute time, what we mean is that our experiences of time are part of each other's experiences. When we watch the film, my wife's temporal experience constitutes part of my experience of the film, just as the film constitutes part of that experience. There is no telepathic power attributed to individuals so this reading is far more appropriate. We come to recognise that our experiences are similar, though subjective. They tie our phenomenology together and show that we both have experiences, reducing the power of the charge of solipsism.

Rodemeyer thinks that phenomenology suggests not a duality of subject/object, but a tripartite, subject-object-intersubjective. The careful examination of my immanent time leads me to objective time and on to world-time. There are two initial steps; first we recognise that objects are available to all, and have meanings for all. Then the subjective but inter-related nature of time builds on this recognition, tying our experiences together. Together we thus constitute world-time. It is through world-time that we all have the same subjective experiences of time.

Given this, we still need an explanation of how we mistake this (inter)-subjective experience for the experience of objective time. Rodemeyer's theory gives us a third realm, not quite mind-independent and not quite mind-dependent. We now need an explanation for why we mistake this subjective experience for the experience of an objective world: why we mistake Epistemic Time for Ontic Time. I turn now to look at two possible explanations: Price's Perspectivalism, and Projectivism. Both do the work required.

5.   *Perspectivalism and Projectionism*

There are two available accounts to explain why we mistake Epistemic Time for Ontic Time: perspectivalism and projectivism. Either is appropriate and I do not intend to choose between them.

Price in a number of places thinks our experience of time is developed because we are *in* time and view time from a certain perspective.

> We are creatures *in* time, and this has a very great effect on
> how we think *about* time and the temporal aspects of reality.
>
> (Price, 1997, p. 4, original emphasis)

Price's focus is on causal asymmetry but we could generalise it as an account of Epistemic Time. Price thinks that the distinctions of past, present and future 'rest on a subjective feature of the perspective from which we view the world' (Price, 1997, p. 156). The *now* is just as much a reflection of our perspective as the *here*. This

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[225] Zahavi, 2003, p. 116.

does not suppose that there is a *now* anymore than there is a privileged *here*. We develop this perspective through our experience of being *in* time. Being asymmetric in time we remember the past not the future, we act to effect the future and not the past. The effect of this asymmetry becomes deeply entrenched within our perspective and is reflected in our descriptions of the world. We can, we assume, disentangle this entrenchment from our descriptions to make them perspective independent. A familiar example is that of secondary qualities, such as colour, taste, smell and so on. These are now considered to be products of our sensory apparatus. Take the taste of a lemon, lemons taste sour but this is not a necessary fact, our sensory apparatus might have been different, such that the taste of a lemon would be sweet. The taste of a lemon is a contingent reflection of our perspective but in what sense, Price asks, is that taste not an objective fact.

What we need is an account to explain why we possess such a perspective. Price believes that we derive our perspective of time from the second law of thermodynamics. Price believes that we are macro-level objects and are subject to the same forces as other macro-level objects. Being macro-level agents we develop a particular perspective about time; that it flows in the one direction. This is derived from the second law of thermodynamics, which holds that a closed system tends to move from a state of order towards a state of disorder. As we saw in chapter 5, the second law of thermodynamics is not sufficient to give time its direction. The law is statistical at best, and does not rule out a decrease rather than an increase in entropy.

The direction derived from the second law is contingent, but we cannot infer from this contingency that we are able to change it. The taste of a lemon is mind-dependent and contingent but we cannot alter that taste. So it is with our temporal perspective: it is brought about by the second law, and contingent, but it is a perspective we have to have, we cannot choose it. This move by Price solves the intersubjective problem as well. In his (2005) he claims that the perspective developed from being *in* time is one no individual or community can change; 'we humans all share the same temporal perspective' (Price, 2005, p. 3).

Here we have an account of our experience of time being derived not from time itself but from our perspective of being *in* time. Just as there would be no taste of a lemon without creatures able to eat lemons, so there would be no Epistemic Time if there were no creatures to adopt a perspective on time (derived from the secondary temporal qualities of Ontic Time).

We could also explain this through projectivism; the view that we project modifications of time in our experience onto time itself. Projectivism is often invoked to explain the perception of colour. Hobbes (1655), for example, thought we move the sensation of colour from its rightful place, the mind/brain and project it onto the world. Epistemic Time, being so tied up with our experiences, is projected from the structure of those experiences onto the objects of those experiences. Because we see X now and tie it in to our past observations and anticipations of some future event we assume that X is present, was future and will be past. What we are doing here is projecting onto X properties of our mental states. Hume (1739) thought that our *ideas* of one event preceding another involve necessity, we then project this necessity onto those events themselves. Such necessity is not required. The most we can say about such events are that they are contiguous and successive. We are not justified in also positing necessity. We project the necessity involved with our thoughts onto the objects of those thoughts. It may well be the same with Epistemic Time.

Both the perspectivalist and projectivist accounts explain why our experience of time is so different from our understanding of time. Our experience of time has an A-like structure described by Epistemic Time. Epistemic Time is a reflection of our

perspective or a projection onto the objects of our experience. When we analyse our experiences we find that the properties we associate with them are contradictory, invoking McTaggart's Paradox. We understand time in B-terms, but our experience is of an A-time.

Take the example of watching a film. Here I experience that film quickly and project that experience onto the film; 'it [the film] passed quickly'. This is mirrored by my wife's ascription of slowness to the film. Neither experience is derived from our perspective, but from the projection of our subjective experience onto the world.

6.   *Conclusion*

Here I have tried to tie off some concerns developed out of the phenomenological picture of time. We needed an account of how that phenomenology might reflect a common experience of time, and an account of how we take Epistemic Time to be Ontic Time. The intersubjective theory of Rodemeyer gives us the tools to move beyond a solipsistic account of the phenomenology to show that we experience time in the same way, even though it is subjective. We do this through world-time, an intersubjective realm that links conscious beings in many varied ways. I then looked at two ways we could explain why we mistake Epistemic Time for a mind-independent Ontic Time. Either Price's perspectivalism or the account of projectivism I developed could succeed.

Chapter 15
The C+A Theory of Time

1.   *Introduction*
In Part One I developed an analysis of time based on McTaggart's Theory. I argued that the A Theory was undone by McTaggart's arguments, and that the B Theory had problems as a theory of (Ontic) Time. There have been several attempts to complete a B Theory analysis of time, to incorporate our experiences. See, e.g. Mellor (1981, 1998), MacBeath (1983), Maclaurin and Dyke (2002). These accounts, however, seem to be just undisclosed C+A-theoretic accounts. Once the contingent nature of the direction of time is made explicit, these B Theories sound more like a C+A Theory. To develop the C+A Theory I introduced the distinction between Epistemic and Ontic Time. At the heart of Epistemic Time are the A series distinctions present, past and future. Epistemic Time is mind-dependent in ways analogous to the mind-dependency of our perception of 'secondary qualities' such as colour.

In Part Two I provided a phenomenological examination of the lived experience of time to flesh out this analogy. This experience involved features that seemed to be mind-dependent; experiences changed speed with preferences and interests, the Present Moment is spread out in time and loaded in ways not easily mapped onto Ontic Time, and time flows in the one direction, but this direction is a reflection of being an object *in* time; we tend however to experience time as having direction.

We then need to explain why we can use this phenomenological picture to describe a mind-independent phenomenon. Rodemeyer suggested a tripartite, subject-object-intersubjective account of phenomenology. Careful examination of our experience of time leads us to objective, world-time. We recognise that objects are available to, and have meanings for, everyone; that the subjective, inter-related nature of time builds on this recognition, tying our experiences together; thus together we constitute world-time. It is through world-time that we all have the same subjective experiences of time.

To explain how we mistake Epistemic Time for Ontic Time I proposed two accounts: first a projectivist explanation, then Price's perspectivalism. Either could, I believe, explain the mistake we make in taking Epistemic Time for Ontic Time.

Here I will tie in these conclusions to sketch the C+A Theory. I will argue that the C series gives us the ontology of time, the A series gives us the epistemology of time and the B theory gives us only an account of *being* in time. I will also look at a theory developed by Rogers (1905), which mirrors my theory in all but one important aspect. I will argue that we have reasons to prefer my theory above Rogers'.

2.   *An Initial Statement of the C+A Theory*
The C+A Theory of time involves an ontology described by the C series, together with an epistemology derived from Epistemic Time, best described by the A series. Our perspective of time relies upon the (contingent) state of the universe reflected by the B series.

Ontic Time is a serial ordering of events set out between other events. We can think of this as a serial ordering along the T axis of a four-dimensional space-time. But Ontic Time cannot account for our experience. Our experience is A-ish. Epistemic Time is an epistemological group of functions that help us deal with the world as we find it. We structure our experiences through Epistemic Time, such that we mistake Epistemic Time for Ontic Time.

Recall the distinction between an ET_1 interpretation of Epistemic Time and an ET_2 interpretation. ET_1 describes Epistemic Time as a cognitive function of the mind/brain. ET_2 describes Epistemic Time as a mind-dependent property, putatively of Ontic Time, analogous to secondary qualities. It is the cooperation between these two that allows us to capture the non-verbal nature of our A-ish experiences. In the phenomenological studies of Part Two we saw this cooperation between Ontic and Epistemic versions of Duration, Succession and Direction. There is a feature of our experience of time, the Present Moment, with no Ontic counterpart.

Since all our experiences are had from the Present Moment this suggests that all our experiences, whatever their source, are placed into this Epistemic structure. We are led to think, ordinarily at least, that the time we experience *is* the time we understand. Epistemic time either reflects our perspective of being *in* time or is projected onto the structure of time itself.

This all occurs within time itself. We are in time like every other thing is in time, and as macro-objects we are subject to the physical laws, of thermodynamics, etc. Our experience of time is guided by this fact. The B series is an appropriate description of things *in* time, the A series is an appropriate description of our experiences as things in time, but only the C series is an appropriate description *of* time itself. Only the C series gives us enough, and no more than enough, to do our science.

This then is the C+A Theory of time. Time itself is described by the C series. Our experience of time is a combination of mental constructs (The A series) and contingent forces (The B series). What we need now is to flesh out in non-phenomenological ways the claim that Epistemic Time is mind-dependent.

3.   *The Mind-dependency of Epistemic Time*

So far I have merely drawn an analogy between Epistemic Time and perception. Features of the universe such as colours seem to be mind-dependent. Temporal features of the universe also seem to be mind-dependent. I will look briefly at some ways to construct this mind-dependent account. One based on Price's Agency Thesis takes this mind-dependency to be contingent, a result of our *being in time*; Maclaurin & Dyke offer an evolutionary explanation for our experience, we evolved to fear the future and be relieved about the past. I then turn to a more Kantian view taking Epistemic Time to be a cognitive function of the mind/brain which structures our experience in many ways. These explanations are compatible and only meant to flesh out the mind-dependency thesis of Epistemic Time.

Price (1997) thinks that the structure of the universe is symmetrical. He takes Quantum Mechanics (QM) to be his paradigm description of the universe. He thinks that where we have removed the 'prejudice' that time is necessarily directed at the macro level, at the micro level this view remains. Once we remove this bias, the unintuitive results of QM become more comprehensible. If we allow for backward causation, then problems of non-locality etc., dissolve somewhat. However, as macro objects *in* time we are subject to the same macro, but contingent forces as the rest: the second law of thermodynamics. Our experience of time is derived from being macro objects subject to the second law. As a result our temporal perspective is biased.

> We are creatures *in* time, and this has a very great effect on
> how we think *about* time and the temporal aspects of reality.
> (Price, 1997, p. 4, original emphasis)

Being asymmetric in time we remember the past not the future, we act to affect the future and not the past. The effect of this asymmetry becomes deeply

entrenched within our perspective and is reflected in our descriptions of the world. We can, we assume, disentangle this entrenchment from our descriptions to make them perspective independent. A familiar example is that of secondary qualities, such as colour, taste, smell and so on. These are now considered to be products of our sensory apparatus. Lemons taste sour but this is not a necessary fact, our sensory apparatus might have been different, such that the taste of a lemon would be sweet. The taste of a lemon is contingent but Price thinks still counts as an objective fact. We can develop an independent description of the lemon, despite the contingency and mind-dependence of its taste. We can do the same with our temporal perspective.

Maclaurin and Dyke (2002) claim that we evolved to be relieved that pain is past, and to fear future pain. We evolved with concepts about the past and future and these inform our perspective. This is how beings in time can have A-ish hopes, fears etc., in a B-world. Our experiences are tensed because it proved evolutionarily successful.

Maclaurin and Dyke's evolutionary theory suffers a slight problem in that they claim that our fears etc., are directed, either towards the past or future. As a result I think that their theory has less explanatory power. The A-theorist has a ready explanation for this perspective; it is the A-ish features of time. Maclaurin and Dyke need something more concrete than future directed emotions. Why should we fear the future *over* the past? We need an account of why our experiences are directed without some external direction. That can be provided by Price's theory so this is not a big criticism, just a request for more work.

Having looked at these two, quite satisfactory accounts I now turn to look at a Kantian interpretation. Without wishing to develop an in-depth analysis of Kant I will try and set out the core of Kant's views of time to flesh out how Epistemic Time in the form of ET_1 operates: ET_1 being the system that enables us to have temporal experiences.

4.   *Kant's View on Time*

In chapter 7 I set out Kant's view of time in the following terms. He took time to be an a priori concept imposed upon experiences. He developed this account because he thought we could reason a priori using temporal concepts such as succession and simultaneity. He thought that since this reasoning was *pure a priori*, and involved no empirical concepts, that time had to be a priori. This is the essence of Kant's thought though I have not tried to develop the complexities of his argument. It is enough to show here however that because we seem to have the concepts of succession and simultaneity prior to any possible experience, that Kant thought time was a structure imposed upon our experiences and the condition for the possibility of experience at all. Kant believed that 'Time is nothing but the form of inner sense, that is, of the intuition of ourselves and of our inner state' (Kant, 1781, p. 77).

I rejected Kant's conclusion arguing that instead of imposing time on a timeless world, we structure time in a cooperative way; properties of time and properties of our cognitive abilities cooperate to give us our experience of time. Part Two was a phenomenological analysis that provided some support for this position. We experience succession and duration, and perceive the world from a Present Moment. This constitutes the flow of time. That flow can largely be explained in terms of mind-dependent features of time (ET_2) and the system we have to interpret those features (ET_1). The variation in speed of succession, of length of duration could be explained in terms of ET_2 the necessity of direction seems more attuned to

ET$_1$. The fluctuations seem more to be an interaction between mind-dependent properties of Ontic Time.

The story is more complicated than a basic Kantian representationalist thesis, or an objective temporal data thesis. The mind-dependency of Epistemic Time is more a mixed theory, where some features are mind-dependent but objective (ET$_2$) and some features purely mind-dependent (ET$_1$).

5. *Does the phenomenological evidence support the A, B or C+A Theory?*

I turn here to attempt to build alternative theories out of the phenomenological data. I turn first to the A Theory then the B Theory but reject both in favour of the C+A Theory. I show why the C+A Theory is the coherent and simple alternative available. The majority of work has been done in rejecting the A and B Theories. My intent here is just to rehearse the arguments to consolidate the position of the C+A Theory.

Lowe (1998) thinks one of the strongest arguments for the A Theory is that our experience shows us that time is A-like. But if our experience is as the phenomenological data suggests then Lowe's claim seems mistaken. Time cannot involve a Present Moment that incorporates my memories of previous moments and anticipations of later ones. If my experience of the Present Moment were of an ontological entity, as we experienced it, then that moment would incorporate my memories and expectations. Experience acts as no guide to ontology here. Lowe might respond that even though our experience of time involves this phenomenology, time itself does not; the structure of our experience reflects the structure of time. We see the Present Moment and impose the memories etc. Even though our experience of time involves the Present Moment plus retentions and anticipations, Ontic Time itself only involves the unextended, or atomic, Present Moment.

I believe that to be able to observe the Present Moment our experience needs to be extended beyond that moment. McKinnon (2003) argues, for example, that the Present Moment is not long enough to ensure that we have conscious experiences. To be conscious, our neurons need to fire and receive information. If our existence is restricted to the Present Moment then neurons cannot fire and receive information. We cannot be conscious.

There are two responses available to the A-theorist here. First, there is no requirement within the A Theory that the Present Moment be unextended. All the A Theory requires is for there to be a privileged moment, or interval, in time that moves from the past into the future. Second, even if the Present Moment is unextended, there is no requirement that for one to be conscious the same neuron has to fire and receive information. At time T certain neurons may fire, say the group of Φ-neurons fire whilst the group of Ω-neurons receive information. Time T moves on to time T^{+1} when it is the Φ-neurons that receive whilst the group of Ω-neurons that fire information, and we experience T^{+1} as the Present Moment. Here neurons are firing and receiving, but we are still able to take the present Moment as being unextended.

However, whilst the phenomenology may seem to support a move towards the A Theory, that move cannot be completed. The C+A Theory is a theory that includes ontological claims as well as phenomenological claims. The phenomenology gathers the evidence to explain our experience of time. The A-theorist wants the phenomenology to provide the evidence to explain time itself. Whilst this move is allowable within a phenomenological study, the ontological commitments of the A Theory are not supported by the ontological evidence. SR does not have an A-structure. The phenomenology is enough to start theory building, but not enough to complete it. Completion requires theoretical importation, and the imports of the A Theory are unsustainable.

Nor does the phenomenology support the B Theory. The science certainly supports the B Theory and, compared to the A series, the B series is at least consistent. But the phenomenology suggests an A-theorist interpretation; the phenomenology is A-ish, not B-ish. So the phenomenology cannot be said at an experiential level at least to support the B Theory.

So much for phenomenology the B-theorist may respond; we still have science. But the move to science does not support the B Theory. The B-theorist appeals to science; but the only support given by science is a support that asserts the reality of time as a dimension of space-time. B-theorists tend to assume that time has a direction, and no such assumption is inherent to the physical theory: earlier than and later than are not contained within SR. The B-theorist could respond here that whilst direction is no part of SR, temporal direction *is* an ontological fact, but one that is contingent and derived from forces *in* time. This claim, however, suggests that once the B-theorist has discharged the assumption that time *is* asymmetric, he is more aligned to the C+A Theory, than the B Theory.

The only ontological claim supported by science is the claim made by the C+A Theory; that time is no more than the (symmetrical) fourth dimension of space-time. The C+A Theory takes its ontological claim from science, and that claim is a bare one; Time is symmetrical, it has no Present Moment, nor a preferred direction. Built onto the C+A Theory is the explanation for our experience of time, and that is derived partially through the phenomenology.

6.   *The C+A Theory of Time*

According to the C+A Theory, time is no more than the fourth dimension of space-time. A dimension similar to space; time has no preferred direction, no special, privileged moment, and no distinction between one privileged area, the past, and another, the future. This conception of Ontic Time cannot explain our experience of time. Instead our experience of time is derived from properties that are brought about by Ontic Time but rely on the existence of minds/brains (ET_2). These properties are combined with certain mental constructs projected upon our experiences by that mind/brain (ET_1). The combination of these two factors gives us Epistemic Time, and it is through Epistemic Time that we explain our experience of time. The C+A Theory reduces to the claim that time is an Ontic Time built around the C series, and our experience of time is derived from Epistemic Time.

7.   *Rogers' Proto C+A Theory*

Rogers (1905) draws similar conclusions. His intent is to derive an objective determinant of the direction of time. He does this by developing what I am calling a C+A Theory of time, though my theory differs from Rogers in one distinct way. I believe that the direction of time is a contingent feature of being *in* time. Rogers thinks it the result of some Kantian Universal Will. Apart from this, Rogers has proposed a C+A Theory very similar to my own. I will agree with all of it, except the Kantian claim.

Rogers rejects Kant's claim that the time order is determined by the cause-effect order. Kant thought that the irreversibility of the cause-effect relationship depended upon the irreversibility of the relation between our ideas of cause and effect. Rogers rejects this, arguing that our ideas of cause-effect are abstractions from the world. But the world cannot be separated into one cause and one effect. Rogers argues that the most we can talk of are causal conditions. 'A Cause *in concreto* is the entire complex of phenomena existing at any given instant' (Rogers, 1905, p. 62, original emphasis). Any moment in time has a complex nature. The identification of one event as the cause and one event as the effect is an arbitrary

abstraction that ignores this complexity. Rogers thinks that the identification of *a* cause is the result of the interests of the observer. Since we cannot isolate *a* cause and *an* effect, we cannot use that to determine the time order.

Neither can the laws of nature determine the direction of time. The laws of nature are time symmetric, which, Rogers argues, suggests that time itself is symmetrical[226]. Rogers believes that time is a one-dimensional continuum.

> In that science [dynamics] – as in all abstract sciences – Time is regarded as a one-dimensional continuum (*t*) in which the *order* of events is necessary, but the *direction* is conventional.
>
> (Rogers, 1905, p. 65, original emphasis)

Roger thinks this an accurate description of time, which means that time itself has no direction.

It follows that the direction of time is a psychological phenomenon. '*Apart from conscious existence in the time-series the Time-direction is indifferent*' (Rogers, 1905, p. 67, original emphasis). Rogers explains the psychology of our experience of time in ways quite similar to my take on Epistemic Time. Rogers examines what he calls 'units of consciousness' (Rogers, 1905, p. 69), and finds that there are three elements; broken into past, present and future. The past is based on memories, the present, on perception and experience and the future is based on expectation. These three elements intermingle in what we now call the Present Moment. Rogers now adds an agency thesis.

> The subjective root of our concept of future and past time is, however, not expectation and memory in a passive sense only; it includes desire and aversion generally, that is, a sense of mental activity.
>
> (Rogers, 1905, p. 69)

Since our desires about the future drive our actions, we are active in time, notably towards the future. This means that the direction of time is a perspective we develop as creatures *in* time.

8.   *Problems with Rogers Account*

So far I have many reasons to agree with Rogers, but he makes one move which I will reject. Rogers thinks that the time order is objective and necessary. Rogers adopts a Kantian perspective; arguing that there is an objective and necessary determinant of the time-order. But this is not objective in the physical sense. Rogers thinks it objective in that it is beyond our conscious control: a psychological, not a physical phenomena. But we *all* experience that direction of time. Rogers thinks this direction is necessary because it is Kantian. This direction is the result of the application of a Universal Will.

> *There is one Time-direction for all in so far as they will the same thing*. The unity of the Time-direction is thus a mere hypothesis except on the assumption of a universal object of will common to conscious beings who have a rational consciousness of their existence in Time.
>
> (Rogers, 1905, p. 71, original emphasis*)*

Rogers thinks the assumption of some common future towards which we all *Will* is required if there is to be 'one Time-direction common to all conscious beings' (Rogers, 1905, p. 71). To get necessity out of this Rogers argues that this common goal is 'that which is an object of Universal Will' (Rogers, 1905, p. 72). This

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[226] Rogers was working with Newtonian mechanics but his argument still applies.

common goal is a Quality that motivates the desire of the Universal Will. The Quality is a common good for humanity derived from Kant's moral law.

I will raise three problems for this conclusion. First it makes the direction of time mystical at best, second, it cannot explain the direction of non-psychological phenomena, i.e. that objects and events seem directed in time. Third Rogers' theory removes us from the world and makes us observers. The result here is that Rogers cannot claim we are *in* time at all.

First Rogers thinks some future Quality derived from Kant's moral law is the impetus that drives the direction of time. I believe that this makes the direction of time mystical. Rogers claims that when we all move towards the future we are connected to the secret nature of that common goal. 'To will the same object … [is] to will something as an absolute end' (Rogers, 1905, p. 72). Since we all move in one direction in a directionless world, Rogers believes that when 'two persons will the *same* object, they are in touch with this secret Nature' (Rogers, 1905, p. 72); a secret nature that is the Universal Will common to all. Some secret nature of a common goal of humanity impels us towards the future, rather than the past. In a symmetric world, the asymmetry is derived from this future psychical common good, made available to conscious Beings through the Universal Will. This makes any explanation for that direction entirely mystical. Some future based common goal forces us *now* in the one direction. We cannot explain this in any better ways, but as an explanation it is too mystical to satisfy.

Rogers might have an initial response here, but that is undone by my second claim. Rogers can claim that the direction of time, being some Kantian imposition on the world, is really about our experiences of time, not time itself. As I have argued about Epistemic Time, a Kantian interpretation of time explains why our experience of time is so different to time itself. Similarly, Rogers can argue that since time is symmetrical, we can explain our asymmetrical experience of time in this Kantian way. This Universal Will, Rogers explains, may be a process of evolution or a developmental feature of our consciousness. However, his claim that the impetus for the direction of time is some psychological fact is undone, for there are physical processes we experience, independent of the mind/brain and these require an explanation Rogers is unable to give. We appear to get older, plants start out as seeds and grow into plants and fruit and so on. The direction in time has physical effects, on our bodies, on plants. We can quite legitimately reverse these processes but they are asymmetric processes; seeds grow into plants then die, they do not return to a seed, so reversing the effect will start with a dead plant, which comes alive and then turns into a seed. Rogers' theory can only account for our experience of direction, it cannot account for what seems an objective fact that objects and events in time are directed. To do that he needs to explain how this psychic phenomenon has physical effects. A Universal Will derived from Kant's moral law is unlikely to do that.

Third, this thought leads us to the conclusion that Rogers' theory removes us from the world. Since the direction of time is a psychical phenomenon, one that appears to have a physical effect upon us, then why assume that there is an objective world at all? We observe processes and events in time that appear directed. Since there is only a psychological explanation for the direction of time, there can only be a psychological explanation for the apparent direction of objects and events *in* time. This entails that either we are dealing solely with appearances, which should be acceptable to a Kantian like Rogers, or there is some psychic influence in the physical world. Neither option is attractive.

Given these objections I believe we ought to reject Rogers' final conclusion, but agree with much of his argument. I leave Rogers here but wish to quote him once more, to show how aligned our theories are:

> The essential difference between Past, Present and Future has, I conclude, no meaning when Nature is regarded externally, that is, as a complex of lifeless phenomena. Externally viewed Nature is a unity possessing an infinite series of phases (Moments). Each phase is necessarily connected with the contiguous phase on either side of it, in the one-dimensional continuum of time. But no Time-*direction* emerges from this view of Nature. The Time-direction only emerges when the mind returns to itself and views Nature internally or from the subjective point of view.
>
> (Roger, 1905, p. 68, original emphasis)

Rogers takes this internal view too far, for we can derive a direction of time from the physical, but contingent features of the universe, not some psychical feature of the world. All we need do is reject the claim that this direction is *necessary*. Once we have done this we have the C+A Theory of Time.

9.   *Conclusion*

I have developed a C+A Theory of time out of the conclusions of Part Two. Time itself is explained by the C series: our experience of time is derived through our interaction with that C series through Epistemic Time. Epistemic Time is a rich combination of mind-dependent properties brought about by Ontic Time (ET_2) and a mental system that reads these properties and imposes others over and above them (ET_1). We have here a prima facie explanation for time and our experience of time: Time is Ontic Time; our experience of time is mediated through Epistemic Time. This theory is preferable to the proto-C+A Theory developed by Rogers.

In the following chapter I set out some alternative conclusions drawn from the phenomenology. The conclusions are not radically different from mine, and point towards the claim that the phenomenology does not generate too many conclusions; which is what we want if that phenomenology is tied to reality. I then sketch a possible model for how Epistemic Time itself actually works. An account of this has yet to be offered, so I complete that task there.

Chapter 16
Different Responses to the Phenomenology of Time

1.   *Introduction*

I have employed the phenomenological data of time to draw some specific
Husserlian conclusions. Alternative conclusions may also follow from Husserl's
work, and I turn here to look at some of them. Heidegger developed existential
themes, applying them to an ontological study of human existence; Sartre drew
conclusions about identity; and Merleau-Ponty developed a theory of consciousness.
I intend here to provide an overview of the lines of thought these philosophers have
developed. I will couch my responses in terms of the A Theory, as each
philosopher's work will add to my claim that the A Theory is attractive because it is
tied into our experiences, not our thoughts or language about experiences. This is
terminology the philosophers themselves did not employ. Even so, the message of
this chapter is one of support. The A Theory is so attractive because it is tied into
our experience. Our experience of time is so different to our understanding of time
because our experience has been structured by the mind/brain.

2.   *Phenomenological Evidence*

Let us recap on some phenomenological evidence: In 'The Noisy Car' you
observe a car driving along a street, hearing the tune being played on the car's stereo.
The car exists for the entire observation; it has its own duration. The car moves
successively and sequentially, from the right to the left. You observe the car from
one moment at a time. Despite this you can observe several things not restricted to
that moment. You recognise the tune, even though at any one moment you only hear
one note. You observe the motion of the car, even though at this moment you only
see the car. Your mind/brain builds the past and future into your present perception.
The car moves in the one direction, from the past, into the present and then into the
future.

From this I developed claims for the C+A Theory of Time. I drew an
analogy with the perception of 'secondary qualities' to get a grip on Epistemic Time.
Epistemic versions of duration and succession tended to vary with the interests of the
observer. The Present Moment is only epistemological and has no ontological
counterpart. The C+A Theory involves the claim that time is Ontic Time, and our
experience of time is derived from Epistemic Time.

Several other theories have developed focussing on the phenomenology of
time. The theories I turn to here are the existentialism of Heidegger, Sartre's theory
of identity and Merleau-Ponty's theory of consciousness. These different approaches
converge to reinforce my conclusions, so some investigation of their work will lead
to a deeper understanding of our experience of time.

3.   *Heidegger's Existential Ontology*

Heidegger develops a theory compatible with the C+A Theory. Time itself is
atemporal, C-ish, but our experience of time is A-ish. '[Movements] of nature do not
flow off 'in time' … they are encountered 'in' the time which we ourselves are'
(Heidegger, 1979, p. 320). The familiar, dynamic, A-ish time is part of who we are,
not an objective feature of the universe[227].

Heidegger bases an existential ontology upon the examination of Being.
Being is the most general concept, to exist is to *Be*. Heidegger believes that an

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[227] Heidegger, 1927, pp., 370 – 380.

understanding of ourselves is the first step in understanding Being in general[228].
'[To] work out the question of Being adequately, we must make an entity – the
inquirer – transparent in his own Being' (Heidegger, 1927, p. 27). Heidegger argued
that since time is central to our existence, to explain what it *is* to be human we must
include time.

> [Temporality] is the condition of the possibility of all understanding of
> being; *being is understood and conceptually comprehended by means of
> time*.

<div align="right">(Heidegger, 1975, p. 274, original emphasis)</div>

Heidegger's account of time is largely derived from Husserl; Heidegger applied an
existential analysis of *being* human to Husserl's concept of time.

Heidegger thinks that within the mind-dependent structure of past, present
and future, we project what we *want ourselves to be* onto a future version of
ourselves. This is the existential asymmetry of time. The *Being* of Dasein lives in
the projection of his identity onto a future and ideal self[229]. When we analyse
ourselves, it is generally a future version of ourselves that takes precedence. For
example, I wish to *Be* an academic and that informs my present self-analysis.

We project what we want to *Be* onto a future self. But Heidegger thinks that
we can never achieve this projected persona. Whilst some of our goals are realised,
we are forever setting new goals. Take my wish to graduate. Once this goal is
achieved I reinvent myself in light of a new goal, to be an employed graduate. Once
employed I want to become good at my job, then get promoted and so on up until my
death. Death is problematic, for as a *Being* forever focused on the future, death cuts
off such a way of existing, it means that some goals will never be achieved. As a
Being, Dasein is future directed; Dasein is characterised as the *Being* who projects
himself into the future. Upon his death, Dasein is no longer able to make such a
projection. But this is natural, for death is the end of life, and Dasein is only one way
of living[230].

A person only comes to understand what he *is* by understanding what he can
Be in the future. There are many forms that this temporalizing the future takes[231].
The form that Heidegger is interested in is the authentic form. He distinguishes
between inauthentic and authentic beliefs. Inauthentic beliefs are ones that we just
hold, without analytical examination; those we tend to pick up from society, not
those that we develop ourselves. Our beliefs only become authentic when we
critically engage with them and, after careful consideration, adopt them. We can be
authentic or inauthentic but Heidegger believes that we are only true to ourselves
when we are authentic.

When we anticipate the future, we rely on our conscience to actively move
towards it; we choose that future. This is an authentic understanding of our future.
If we wait for the future, and think it something beyond our control, we understand it

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[228] Heidegger intended his examination of Being in general to take up six books, *Being and Time* he
developed as the first two books of his study, a study he did not complete, in its original form at least.
[229] Dasein is Heidegger's term for one way of *Being* human. Dasein is 'to be, there'. It is the future
directed way of existing that is Heidegger's focus in *Being and Time*.
[230] Here there are two differences between Heidegger and Husserl. Husserl's focus was on the Present
and he thought that we were conscious of time extending infinitely into the future and past.
Heidegger's primary focus is on the future, but he also thought we could not be conscious of time as
infinite. The horizons for our conscious awareness of time are set by birth and death; thus time is
phenomenologically finite.
[231] Temporalising the future here does not mean that we impose a temporal structure to the future,
which sounds absurd, but rather refers to the fact that we place ourselves into a relationship with the
time that we have yet to experience.

in an inauthentic way. The future involves a battle between the inauthentic and the authentic. Heidegger believes that we are mostly future directed.

There are other ways of interacting with the world. We also look to the present and the past. How we view our present self is determined by our future self and our past self. There is no point in studying for a PhD unless I have reached a certain standard. Past actions govern present actions. The future plays a central role, for I only act today to bring about some future based goal. I also re-evaluate the past in light of the future. I may think that my past actions were wasted if I change my goal from being an academic to being a road sweeper.

Heidegger develops his theory out of the phenomenological work on time by Husserl. I drew different, but compatible conclusions; given the phenomenological evidence we see that alternative theories with time as central can be developed. Heidegger's existentialism shows that in many complicated ways, the A series is central to our concept of Being. The A series is central to what it is *to Be*.

Heidegger's theory is consistent with Epistemic Time. I believe that we project Epistemic Time onto Ontic Time and, without reflection, we *assume* time is Epistemic Time. This is our common understanding of time, an A-ish understanding. Heidegger's existential ontology shows why we cannot merely dismiss the A Theory as mind-dependent.

Heidegger believes that human existence in time involves past, present and future, but that these are features of *our* experience, not the world itself[232]. We then project these onto the world, a world that is atemporal.

> All ontical experience of entities – both circumspective
> calculation of the ready-to-hand, and positive scientific
> cognition of the present-at-hand – is based upon projections
> of the Being of the corresponding entities – projections which
> in every case are more or less transparent. But in these
> projections there lies hidden the "upon-which" of the
> projection; and on this, as it were, the understanding of Being
> nourishes itself.
>
> (Heidegger, 1927, p. 371)

Heidegger's existential ontology helps us explain why verbal based explanations for the attraction of the A Theory are inadequate. Our existence is largely non-verbal[233]. If A-time is central to our existence as Heidegger claims it to be, then we can only explain the attractiveness of the A Theory by addressing our entire existence, both verbal and non-verbal.

4.   *Sartre's Theory of Identity*

Sartre (1943) believed that the past present and future are constitutive elements of human identity, not some property of the world; time is tied into human agency and as such, central to what it is to *Be* human. 'Temporality exists only as the intra-structure of a being which has to be its own being' (Sartre, 1943, p. 136). If so then the past, present and future are the related structures involved in *Being* human.

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[232] Heidegger, 1927, p. 374.

[233] I mean by non-verbal here experiences that cannot solely be described by analysing our language. An experience of the redness of a shirt cannot be fully experienced by analysis of the words used to describe red. At some point, as Wittgenstein points out, we have to point at something that is red. Our experience of redness then can be seen to be non verbal. This is independent of the debate about whether language is central to experiences, i.e. whether any experience we have is wholly independent of language.

Humans are related to themselves in several ways. The important one for our purposes here is what Sartre calls the 'For-itself'. The Being-for-itself is Sartre's theory of action. Humans can act in certain ways, and they do this because they exist for their own purposes, they exist for themselves. For a human to *Be*, is to Be-for-itself. This Being-for-itself is a relationship, which implies that we are somewhat distanced from ourselves. 'The presence of being to itself implies a detachment on the part of being in relation to itself' (Sartre, 1943, p. 77).

Sartre believes that we are related to our Being-for-itself through time. Take the notion of planning. I am separated from my *Being* by a gulf of nothingness. That nothingness stands before me as the gulf across which I have to travel to become myself; to become the person I choose to *Be*. We can construe this nothingness along temporal terms. It is across the gulf of time, into the future, that I view myself; I see my self across a chasm of time into a future time.

Sartre follows Heidegger in taking past, present and future to be internal structures of conscious beings. *Being* exists in all three dimensions, past, present and future. Like Heidegger, the future plays a central role. *Being* becomes united when focused towards the future. But to unify ourselves by focusing on the future, we must overcome what we *are* and what *we have* been; the past and present also play a role. *Being* is distributed throughout the three dimensions of temporality[234], the past, present and future: the A-series.

> Thus the time of consciousness is human reality which temporalizes itself as the totality which is to itself its own incompletion; it is nothingness slipping into a totality as a detotalizing ferment.
>
> (Sartre, 1943, p. 149)

The time of our experience is one which we construct as conscious entities, to separate our existence *now* from our desired existence. Because we never fully exist at one point, we are incomplete. It is across time, notably the future that we are aware of our incompleteness.

The time that we are aware of as the future is the void across which we must travel to complete our identity. The past is a region we have travelled across to get to our present position. Sartre, like Heidegger, takes time to be a basic structure of our consciousness, 'temporality can only be a relation of being at the heart of this same being' (Sartre, 1943, p. 136)[235]. Time is central to our identity, for it is through time that we decide who we want to be, based on who we were, and what we can become.

Sartre's views also highlight the force of the A Theory. As a structure of conscious Beings, the A series cannot be dismissed as mind-dependent, rather a full account is required. We need an account of the role the A series plays in the mind/brain. Sartre provides just such an account. As a way of relating to ourselves, time cannot merely be verbal content, or belief content, time is part of the structure of the mind/brain and as such cannot be accounted for except on those lines[236].

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[234] By dimensions of temporality I mean the three ways we can experience time, not that time has three dimensions in the traditional sense.

[235] European philosophers tend to speak more of temporality than time. This seems more appropriate, for my constantly talking about *time* here could be misconstrued as what I have called *Ontic Time*, when it is really what I have called *Epistemic Time*.

[236] Gallagher & Varela, 2003, draw similar conclusions. They argue that Husserl's analysis is central to our sense of agency. Specifically protention gives a projective sense of what *I* am about to do. Since this protention is about what *I* am about to do, Husserl's temporal phenomenology plays a central role in our identity as agents.

5. *Merleau-Ponty's Theory of Consciousness*

Heidegger developed an existential theory out of Husserl's phenomenology of time, and Sartre developed a theory of Identity out of Heidegger. Merleau-Ponty (1962) develops a theory of consciousness out of Husserl's work. Merleau-Ponty's project is to establish a link between the outer world of realism, and inner world of idealism. He accepts the common view of idealism, whereby nothing exists except as an object for consciousness. Merleau-Ponty takes realism to be the view that we are introduced to a mind-independent world. Time is required if we are to reconcile idealism with realism; to establish a link between consciousness and nature.

Merleau-Ponty believes that the past, present and future are the structure of our experiences, a structure central to our consciousness. The past, present and future are subjective and keys to that subjectivity. This is Merleau-Ponty's starting point; time is not something we are conscious of. Time is something we are conscious *through*. Consciousness *is* the result of a process of temporalizing our experiences; consciousness 'is the very action of temporalization' (Merleau-Ponty, 1962, pp. 424 – 425)[237]. It is through the process of structuring our experiences into past, present and future that we *become* conscious. It seems that consciousness, according to Merleau-Ponty, is the product of temporalizing our experiences.

One issue addressed by both Heidegger and Merleau-Ponty is the problem of reflecting abstractly on our own *Being*. Heidegger believed we always reflect towards the future. Merleau-Ponty disagrees; he believes that we always reflect on our past existence. '[Even] our purest reflection appears to us as retrospective in time' (Merleau-Ponty, 1962, p. 426). He believes that this abstract reflection occurs in time. Even the act of abstracting our *self* from time *occurs* in time, so we cannot truly remove time from the equation, and nor should we; we only truly understand ourselves by accepting that we *are* temporal. We contemplate our consciousness in time, whilst simultaneously taking time to be central to that consciousness. This duality is central to understanding what it is to *be* conscious.

Merleau-Ponty argues that to fully understand our existence we should acknowledge that *we are* temporal. But we also need to understand ourselves as *Beings* that exist in the real world. Husserl's conception of the Present Moment allows us to form the link between our consciousness and the world. We are restricted to our perceptions of the Present Moment. Our lives and decisions are centred in the present. Yet we do have a future and past existence, and the world exists beyond the present. The Present Moment forms a link between our consciousness and the world. It is by understanding the subjective nature of time and the objective nature of time that we begin to form an understanding of how the subject (us) connects with the world. In my terminology, understanding the link between Epistemic Time and Ontic Time allows us to move beyond the subjective nature of the A series to the world itself, the C series.

Merleau-Ponty, like Heidegger, believes that the world is timeless.

> The objective world is too much of a plenum for there to be time. Past and future withdraw of their own accord from being and move over into subjectivity in search, not of some real support, but on the contrary, of a possibility of not-being which accords to their nature.
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> (Merleau-Ponty, 1962, p. 412)

We may question whether the past and future are capable of acting of their own accord, in the way that Merleau-Ponty claims, but the general line here posits past,

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[237] Merleau-Ponty's use of 'temporalising' here follows Heidegger, where we take ourselves to be the source of the familiar temporal structure of past, present and future. The world appears to be temporal because our experiences are structured into the past, present and future.

and future as subjective features of time. The objective world is just a timeless, randomised collection of events. 'These instances of 'now', moreover, not being present to anybody, have no temporal character and could not occur in sequence' (Merleau-Ponty, 1962, p. 412). Merleau-Ponty means by sequence here *temporal* sequence. The objective world is only temporal in the sense we now talk of as a block universe.

> [There] is one single time which is self-confirmatory, which can bring nothing into existence unless it has already laid that thing's foundations as present and eventual past, and which establishes itself at a stroke.
>
> <div align="right">(Merleau-Ponty, 1962, p. 421)</div>

This *single* time exists simpliciter; it is not brought into existence by any being, and confirms its own existence by presenting itself to be recognised as such. The past and future only exist because of the perspective of conscious entities who exist in this world[238].

Merleau-Ponty believes that we are related to the objective world *through* time. Time is not a property of the world, but a relationship between conscious entities and that world. Time (specifically A-time) *is the process* through which we come to understand the world. But time is not mere psychological data. The past, present and future are not mere concepts abstracted from our perceptions and thoughts. Time is something through which we are conscious, so it makes no sense to then claim that time is something we are conscious of. 'Let us no longer say that time is a 'datum of consciousness'; let us be more precise and say that consciousness deploys or constitutes time' (Merleau-Ponty, 1962, p. 414)[239]. The time of our experience is not the time independent of that experience, for it is only through time that experience is possible.

Merleau-Ponty's theory of consciousness shows why attempts to explain the attractiveness of the A Theory based on verbal accounts fail. Since consciousness is more than thought and talk, any account of the A-ishness of our experience has to address that experience. Merleau-Ponty attempts to do this from within a phenomenological study. But it is enough for us here to see that the issues addressed by Merleau-Ponty reflect the fact that our entire experience is A-ish.

### 6.	*Different emphasis in Husserl, Heidegger, Sartre and Merleau-Ponty*

Whilst the phenomenology in Husserl, Heidegger, Sartre and Merleau-Ponty are similar, their focus differed significantly. Here I briefly outline these differences to distinguish between Husserl, and what might be though of as a group of Husserlian scholars. Rather Heidegger et. al., developed their own theory out of Husserl, and did not just clarify his points.

Husserl's main focus was on the Present Moment, which took primary phenomenological importance. Heidegger by contrast focused instead on the future. Heidegger's existentialism makes no sense unless we focus on the future. We cannot change the past, nor affect the present. But we can change what we want to *Be*, who we want to become. Heidegger thought that temporality is central to *Being* and that to *Be* is to *Be* directed at the future. Sartre followed Heidegger in focusing on the

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[238] In some ways Merleau-Ponty's theory can be likened to Presentism, in the sense that there is only the one time, and that those things not at that time do not exists. However, when we note that he takes this one time to be the four-dimensional time of the Block universe, we see that this is only a similarity, not a convergence.

[239] Compare two ways of interpreting 'constitutive': we could read it as a necessary component of time; or we could read it as the construction of time. Under the first reading, constitutive comes across as part of the make up of time. Under the second constitutive comes across as having the power to create time.

future. A theory of agency implies that we can act in certain ways. Again, this focuses on the future since we cannot affect the past, though we do have a sense of present agency. Merleau-Ponty by way of contrast focuses on the past. It makes little sense, he thought, to talk about agency, decision making and so on, unless our present action can be guided by past decisions and resolutions. Were we to decide to do X, where X would occur in the future, whilst our focus remained on the present, then we would have no present reason to prepare to carry out X. If so, then we would have no reason to make it in the first place. The decision is in the past, not the present and would, consequently drop out of the picture.

These different focuses show that different conclusions and theories can be developed within the phenomenological groundwork established by Husserl. That a different focus brings out a different conclusion also demonstrates the scope of Husserl's theory of time[240].

7.   *Conclusion*

Heidegger developed an existential theory out of the phenomenology of time, Sartre a theory of identity and Merleau-Ponty a theory of consciousness. All were concerned with explaining how time and Human *Being* were connected. These theories serve to reinforce the attraction of the A Theory. None took the verbal route, and for good reason. The verbal route is inadequate. Any attempt to explain the attractiveness of the A Theory focusing on verbal issues misses a significant amount of the A-ishness that needs to be addressed. In Heidegger that is our existential nature; in Sartre time is part of our identity, time is a process through which we choose who to *Be*; in Merleau-Ponty it is the process of being conscious. All three serve to reinforce the attractiveness of the A Theory, but all three also point to why our experience of time is so unlike our understanding of time. The time we experience is central to our consciousness in several key ways, and cannot then, be identical to a world that is not conscious. The ontology of time is not like the epistemology of time.

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[240] For a useful discussion of these differences see Brough & Blattner (2006).

Chapter 17
An A Model of Epistemic Time

1.   Introduction
In chapter 9 I set out what I meant by Epistemic Time and mind-dependence. I took mind-dependence of Epistemic Time to be analogous to the mind-dependence of the perception of colour. I distinguished between the system of the mind/brain, ET_1, and mind-dependent properties of Ontic Time itself, ET_2. It is the cooperation of these two that gives us the experience of time: I did not set out how that cooperation might work. I turn here to set out a brief model of how such cooperation might work. I offer this only as a hand-waving exercise, to show how Epistemic Time as a complete system could operate.

2.   Information Processing
Smart (1980) argued that the flow of time reflects the flow of information through short-term memory. 'We are aware of the flow of information through our short-term memories and we confuse this with the flow of time itself' (Smart, 1980, p. 13). Smart favours this interpretation but does not develop it much further. To get an idea of how Epistemic Time operates I intend to develop Smart's idea.

The processing of information in the mind/brain involves the transmission and receipt of signals between neurons, the basic cells of the brain, along the communication highways of the brain, the axons and the dendrites. Information, in the form of signals, passes from one neuron along an axon or dendrite to another neuron. Signals move in succession from one neuron at one time to the next neuron at a different time: the signal moves successively in time. It retains its identity because its succession is carried out in an underlying duration, of the signal strength and of the neurons, axons and dendrites for example. These signals carry small bits of information, but not so small that they can be taken to be atomistic[241]. At any moment, for example, we can recognise a melody. If the only information we are aware of is atomistic, only one note of that melody, then we could not recognise the melody itself. These signals carry a significant amount of information. Because this transmission/receipt of information can soon congest the system of axons and dendrites, the mind/brain operates linearly in time to smooth out any congestion.

3.   An Initial Model of Epistemic Time
But information merely passing through a network of neurons, axons and dendrites gives no role for the system, beyond passing information and this is too A-ish. It suggests that A-properties are experienced. We need a more active role for the system. We could say that when information passes through neurons it picks up extra content, temporal content that is then carried along the dendrites and axons. Take a simple network of three neurons, A, B, and C, connected in a linear pattern, from A through B to C. Event X is the car passing the bench, at this moment an idea enters the three neuron system, call it the car-idea. When the car-idea passes through A, information is added, such that it can now be described as car-idea^A. When it passes through B it becomes car-idea^{AB}, when it reaches C, it becomes car-idea^{ABC}. From C (car-idea^{ABC}), we note that the car-idea was, in the past, at A, then in the nearer past, at B, but is now at C. We can further reflect, that when the car-idea was at A, car-idea^{AB} was future. When the car-idea was at B, car-idea^{AB} was present, car-idea^A was past, whilst car-idea^{ABC} was future. Here we see that our thoughts about

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[241] See McKinnon, 2003.

the car-idea are A-ish, and that car-idea itself is A-ish. The A-ishness of the car-idea though is not part of the car-idea until it enters into the system.

Here we have a representation of information passing through a system that mirrors much of the phenomenological work undertaken in Part Two (chapters 10 – 14). Events occur in linear form and our cognitive system organise them into past, present and future experiences.

This analysis takes A-ishness as an interaction between a mental representation (car-idea) of an event (X) and the temporal features attracted to the car-idea through the system it enters into. This gives us the first account of a model for analysing ET_1 but it may be too weak. Because the car-idea does not attract A-properties until it is in the system, and since the system is a model for the mind/brain, we are free to dismiss these properties as mind/brain dependent.

We can turn to a second account whereby the car-idea itself has properties that are dormant until they enter the system. When the car-idea enters the system, these temporal properties become activated. Suppose that when the car-idea passes through A, A activates the car-idea property car-idea^A, such that we have car-idea^A; when car-idea^A passes through B, B activates the car-idea property car-idea^B such that we have car-idea^{AB} and so on. These properties are not added to the car-idea as it passes through the system, but brought out of the car-idea through an interaction with the system. There are temporal mind-dependent properties of event X itself.

The compromise here is neither too A-ish nor not A-ish enough. The A-properties of events are brought about by their interaction with the system. This is a fairly standard secondary quality statement. We see colours for example, because colour exists, but as a mind-dependent feature of the universe: a feature brought out by our system of interpreting light in various ways. The experience of colour requires the existence of light and reflective bodies and a system that can recognise it. When we analyse the surface of objects etc., we think we can develop an explanation that can account for our experiences of colour, as a secondary quality, by providing an account of the primary qualities of that surface. The surface might have, for instance, primary properties that reflect a certain range of colours, generating the secondary quality of that colour. Analogously, we could develop an explanation of ET_1 that can give us an account of our A-ish experience in non-A-ish terms. I turn now to develop a more complete analysis of the interaction between ET_1 and ET_2.

4.   The Interaction of ET_1 and ET_2 that gives us Epistemic Time

How might the cooperation between ET_1 and ET_2 work? Recall the example of the car-idea passing through the three neuron system of A-B-C. This model for analysing ET_1 can be used to show how ET_1 and ET_2 *might* cooperate. The second account accepted above was an account where the car-idea itself has properties that lie dormant until they enter the system. When the car-idea enters the system, these temporal properties become activated. When the car-idea passes through A, A activates the car-idea property car-idea^A, when it then passes B, we have car-idea^{AB} and so on. These properties are not added to the car-idea as it passes through the system, but brought out of the car-idea through an interaction with the system.

Whilst this seemed a good initial construction it now needs some modification. For when car-idea^{AB} is present, car-idea^A is past. Here the property of pastness is attributed to the car-idea represented as car-idea^A whilst the car-idea as car-idea^{AB} is present, here the car-idea is present *and* past and this generates McTaggart's Paradox. The car-idea cannot be both car-idea^{AB} and car-idea^A. The construction here of ET_1 is too weak; the system itself plays too little a role, since X itself seems present and past, and this results in the model making time itself too A-

ish, for the A-ishness of our experience becomes an experience of A-ish events and properties.

To fully work this out as an explanation of the A-ishness of our experience we need an account of the properties of pastness, and futureness. My proposal is that these are properties we should attribute to the system, i.e. the mind/brain. In other words, X has the secondary property of presentness, but we, as a system, have the ability to see the car-idea (a representation of X) as past, present *and* future.

With this model there is only the one piece of information, the car-idea, but the perception of many car-ideas. Take X, the car passing the bench. We observe the motion of the car and anticipate the car's future motion, and remember its past position and combine these together in our present perception of the car. When the car turns into the street (W) at T^{+1}, we infer that the car existed before it entered into our visual field and so can think of it as having existed at a time before T^{+1}. We see that the car is approaching the bench (X), so we see the car at W but experience it as also being at incompatible X and this experience is inconsistent with the car being at one place at a time. We observe the motion of the car because we are able to visualise it in some way as being at two places at once (W and X), even though the car itself is only at one place. The inconsistency here is within our experience of the car and not the car itself, so we can limit the effects of the contradiction. It does not prove that the car is unreal, or that the time when the car is at W (T^{+1}) is unreal. All it means is that we experience it as being at more than one place at a time. We do so because our experience is extended in time and our experiences are dense, or a continuum; as we saw from the phenomenology of Part Two that our experience melds together the past, present and future[242]. In this way our experience *is* of the car being in more than one place at a time. Our experience covers the places taken by the car, during the spread of that experience, even though there is only the one car.

The events covered by this experiential spread need to be close enough together that they fall under what we call the specious present. From the phenomenological studies of Part Two we can conclude that we *do* experience a car in motion, as being in transit between two positions. This means we must see it as being in two positions at once. We *see* the cars motion (more of this in Chapter 18). The best way to account for this is to claim that our perception is as dynamic as the events we experience; we experience objects in motion as being in two (closely connected) places at once because *our experience* is organised to allow us to interpret two events in a simultaneous manner.

5.   Conclusion
This is rather vague and is only intended to provide an idea of how Epistemic Time as a complete system could operate. I set it aside here to turn to some considerations that seem to fall out of this analysis. Our thoughts and experiences, as described by this model at least appear to tolerate contradictions: in the system the car-idea *is* at A *and* at AB, and if McTaggart is correct then this cannot be right. Perhaps it is correct though and McTaggart is mistaken. As far as the model goes, we have a vague understanding of how ET_1 and ET_2 *might* cooperate to give us the experience of time so well described by the A Theory.

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[242] I will develop this claim to density further in chapter 18 when looking at Priest's (1987, 2006) theory of change.

Chapter 18
Paraconsistency and Time

1. Introduction

I have briefly outlined a model of Epistemic Time that suggested that our experiences of some event, such as a car passing a bench, involves an experience of an object being at two incompatible places at once. McTaggart rejected the A series because of its contradictory nature. The A and B Theories also reject contradictions. Mellor (1998) for example, argues that he prefers the B Theory because its language is not contradictory. A-theorists such as Lowe (1998) deny that the A series is contradictory. A consistent theory is preferred.

Some modern approaches to logic have shown that inconsistency is not as fatal to a theory as once thought. These approaches may impact on a philosophy of time: they may undermine many of these approaches, including my own, though I doubt that. I believe the C+A Theory of Time can be stated in consistent *and* inconsistent ways. I will conclude that contradictions lie within the realm of our experience of time. The contradictions I will put forward are more than inconsistent thoughts about our experiences: we *experience* time in an inconsistent way.

First a brief note on terminology. I will use "inconsistent" to refer to states of affairs, whether they be beliefs, verbal or non-verbal experiences, or reality, that are in some way contradictory. To believe proposition P is inconsistent with the belief that ~P. I will use "paraconsistent" to refer to logics that tolerate and restrict the effects of inconsistency. Following Graham Priest I will use "dialetheism" to refer to the view that there are true contradictions.

2. Ex Contradictione Quodlibet

Ex contradictione quodlibet (ECQ) is the logical rule invoked to argue that there are no true contradictions by showing that the presence of a contradiction allows us to validly deduce everything. ECQ is often cited as a reason for rejecting the possibility of inconsistency. We can set this rule out as follows: P, ~P |– Q. ECQ is sometimes defended with C. I. Lewis' argument: Take a simple statement of a contradiction:

1. P, Premiss
2. ~P, Premiss
3. P v Q, 1 Addition
4. Therefore Q, 2, 3, Disjunctive Syllogism.

(1) and (2) contradict each other. (3) is where the interesting work begins. We use the inference rule of Addition: if we have one true statement, we can add another statement in such a way that the new statement only requires that one of the statements *has* to be true in order to preserve truth. To do this, we use the disjunctive 'or', represented by the 'v'. So if P is true, it is also true that either P *or* (any) Q. If Q is a false statement, (3) still remains true because one of the disjuncts (P) is true. It becomes a simple matter of employing the inference rule Disjunctive Syllogism to deduce Q. (3) says either P or Q, and at (2) we have ~P, which entails Q. If we take Q to be 'the moon is made of cheese', we can use this argument to validly deduce an obviously false conclusion (a moon made out of cheese). Within the confines of classical logic, the acceptance of a contradiction is untenable[243].

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[243] Routley et al., (1982) set out the Lewis argument in another way: (1) A & ~A → A; (2) A & ~A → ~A; (3) ~A → ~A v B; (4) A & ~A → ~A v B; (5) A & ~A →. A & (~A v B); (6) A & (~A v B) → B; (7) A & ~A → B, (Routley, 1982, p. 4). The form I have developed also appears in Anderson & Belnap (1975, p. 164). This is merely a difference in style, not of substance. Both ways are sufficient to show that the presence of a (true) contradiction in classical logic entails any conclusion.

We may have reasons to prefer a logic that can tolerate contradictions: paraconsistent logics. Motivation for this can be drawn from the following thought: if we suppose that a contradiction *is true*, then ECQ is not valid, since we can have true premises and a false conclusion. The contentious issue is whether or not there *are* true contradictions. Suppose for the moment that we have reason to suppose that there *might be* contradictions. Then it is at least *possible* to have true premises and a false conclusion, showing ECQ to be invalid[244].

Before turning to motivate claims that contradictions might occur, a few words should be said about paraconsistent logics. Logics that tolerate contradictions weaken at least one rule of classical logic. In the Lewis argument for example, we could deny that Addition is an acceptable rule of inference[245]. If so then we could not deduce (3) from (1) because it does not always preserve truth. A second way is to deny Disjunctive Syllogism[246]. If so then we could not deduce (4) from (2) and (3). Either method can be adopted to show that the presence of a contradiction does not *necessarily* entail everything. Priest (1987) argues that ECQ has only a superficial value. Not all deductions from a contradiction preserve truth. The belief that they do preserve truth is no better than an appeal to received logical theory.

3.   *The Move to a Paraconsistent Treatment*[247]

Paraconsistent logic tolerates the presence of contradictions. There are several reasons why we might accept paraconsistent logic: the intransigence of the logical paradoxes; the problems of large databases; that we can conceive of what ought to be inconceivable; *and* the problems of motion. Combined these form a strong argument in favour of adopting paraconsistency[248].

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[244] Priest (1987) puts it as follows. If contradictions are true, everything would be true, making language unusable. This inference is made because of the inference rule of ECQ. Priest thinks this superficial, since not every q is true, so p & ~p → q does not preserve truth (Priest, 1987, p. 6)

[245] Routley et. al. (1982) set out the arguments developed by Parry for this, and call it 'conceptivism'. Here an implication A → B (A entails B) is correct only when B contains only concepts which occur in A. This is a strong relevance condition placed upon Addition. 'Plainly this makes A → A v B incorrect since B may well, in an obvious sense, "contain concepts" not in A' (Routley, et. al., 1982, p. 96). If B is irrelevant to A, we cannot validly employ Addition to introduce B to the Lewis argument. It follows that we cannot use the Lewis argument to deduce *any* conclusion.

[246] Routley and Routley (1972) for example restrict the effects of a contradiction by arguing that Disjunctive Syllogism (DS) is an invalid inference rule. Priest (2001) argues that the semantics of First Degree Entailment (FDE) formulates an interpretation (to assign truth-values), not as a function, but as a relation between formulas, or propositions, and truth-values. Taking T to be true and F to be false, it is possible for a proposition (formula) to be related to either T, or F, T & F or neither T nor F (Priest, 2001, pp. 139 – 140). It is important to then distinguish between being false under an interpretation and not being true within that interpretation. To achieve this Routley and Routley introduce what has come to be called the Routley star (R*) operator, an operation intended to allow for P and ~P to both hold in the same world W, and to allow for neither P nor ~P to hold in a single world.

    The semantics of FDE shows DS to be invalid. Given P v Q, ~P, it does not automatically follow that the presence of ~P forces us to reject P, in favour of Q, since both P, ~P may hold. In other words, DS is an invalid rule of inference, since it cannot guarantee the truth of a conclusion given true premises.

[247] By paraconsistent treatment, I refer to the need to develop systems capable of dealing with inconsistency: whether that inconsistency is in our pet theories, our beliefs, our information handling and so on.

[248] See Bastiras 2005 for a brief survey of paraconsistency in Ancient Greece. Bastiras believes that Herakleitos was the first dialetheist, dating from 600BC.

One motivation for accepting paradoxes lies in our failure to *deal* with them. Take the liar paradox. To see how the liar paradox works we start with a basic statement.

1.   This sentence is false.

Suppose (1) is true, then in light of what it says about itself, it is false. Suppose now that (1) is false, then in light of what it says about itself, it is true. But (1) is either true or false. Hence (1) is both true and false. Adopting the natural assumption that "α is false" abbreviates to "not-α", the analysis of (1) has brought about α and not-α. Priest thinks that at a prima facie level, this conclusion demonstrates the existence of dialethias, or true contradictions[249].

We cannot seem to settle on a single truth value for (1); trying to fit it into our normal two valued system fails. The reasoning that takes us to α and not-α seems perfectly rational. We understand (1) to say that it is false. Agreeing with this we think that (1) *is* false. We cannot stop at this conclusion however, since if (1) *is* false, then (1) states a truth so is true. But if what (1) says is true, (1) is false and so on. We cannot easily stop at the conclusion that (1) is false because this leads us to the conclusion that (1) is true. This sounds like a regress but it is just a continuous switching of truth values. So much for the standard two-valued system of truth values, we might think.

Instead of trying to normalise (1) we could argue that (1) is *both* true and false. Here we accept the existence of the contradiction. We accept the reasoning above and claim that the existence of the liar paradox suggests in some meaningful way that there are true contradictions; i.e. the claim that the liar paradox is both true and false is itself true. The liar paradox motivates in some way the acceptance of (some) paradoxes. Priest certainly thinks so.

Priest notes that the liar paradox has been dismissed as a triviality not worth solving[250]. In this vein we *could* argue that (1) is neither true nor false. Since nothing can be true *and* false, (1) must be neither true, nor false, making (1) meaningless. Alternatively, some attempts have been made to solve (1) by moving to a hierarchy of languages, as Tarski did. The contradiction lies in one level, but is resolved once we move to a higher level meta-language. These strategies have their costs and many find them unsatisfactory. Priest (1979) suggests that instead of trying to solve paradoxes, we ought to accept and live with them. To live with them we need to reject ECQ as a rule of inference.

Belnap (1976) suggests another reason for moving to paraconsistent treatments; this lies in the realm of information processing. A significant amount of information is kept on computers in the form of databases. Computers both store and operate on such information. It is quite common, Priest (2000) thinks, for such databases to contain inconsistent information. The multiple sources of information together with the likelihood of input error mean that contradictory information is both stored and operated on; hence an underlying logic that can operate with contradictions seems necessary.

Belnap argued that paraconsistent logic is needed if we want computers to be able to deduce and draw conclusions from a variety of sources, and answer questions. Suppose our computer is programmed using consistent two-valued logic. Suppose that Elizabeth tells the computer that Brazil won the 2002 World Cup, and that Sam tells the computer that Brazil did not win the 2002 World Cup: this gives us a contradiction. Within the confines of classical logic two results ensue: either the computer closes down and refuses to work, or the computer works overtime and

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[249] Priest, 2006, p. 9.
[250] See Priest, 1979, p. 219 for an examination of this claim.

draws any possible conclusion it can. On the basis of Brazil winning and not winning the 2002 World Cup, plus ECQ as a logical rule of inference (P & ~P |– Q) the computer could answer particular questions in weird ways. If asked when the next flight from Adelaide to Melbourne was, on Friday, 1 April 2005, the computer could respond that there could not possibly be any flights from Adelaide to Melbourne, and that, furthermore, there are 40,000 per day, leaving three times a week. This is nonsense, brought about by the presence of a contradiction within a system using two-valued logic.

To maintain consistency the computer could refuse an input that contradicts some information it already holds. Belnap believes this unfair. If Sam puts his information in first, and Elizabeth hers second, the computer rules out the truth to preserve the consistency of its database. Belnap notes that contradictions may lie undetected in the system until long after they have been put in. For a computer to operate it needs more than classical logic: it needs paraconsistent logic, which entails the rejection of ECQ.

A strong motivation for accepting contradictions is our ability to observe motion. Take our example of a car passing a bench, X. Before passing X the car is at W, after passing X, the car is at Y. That I can see the car as being at W *and* at Y seems paradoxical; but this is no argument against the fact that the car moves from W through X to Y. Hegel argued that change is derived from the principle of contradiction. '[Contradiction] is the root of all movement and vitality' (Hegel, quoted in Sorensen, 2003, p. 308). Hegel believed the perception of contradictions entailed a reality that was contradictory. He argued that there are no mind-independent properties. If there are no mind-independent properties, then all properties are free to be contradictory. But this is going too far, I think. The most we need to say is that our perception of events in time are perceptions that have contradictory content[251], as I will argue.

4.   *Priest On Change*

The strength of the case for inconsistency of motion is brought out well by Priest (1987) so I will turn to an exposition of his theory. Priest believes we need paraconsistency if we are to make sense of motion. If this is the case, then it is sufficient for my claim that our experience of motion needs paraconsistency[252].

Priest's analysis starts with change, and since motion is change in position, his theory is applicable here. At one moment a car is stationary, the next it is moving, how has this change come about? Priest formulates this problem as follows. At time T, the car, X, is in a stationary state, X is S, call this SX. At time T^{+1}, X is in a state of motion, M, such that X is M, or MX. The moving car (MX) contradicts the stationary car (SX), so we can say that the car at time T is stationary, SX and at T^{+1} is not stationary, ~SX[253]. But time T is the moment when the car starts to move, so what state is X in at time T? Priest proposes four possible answers

A)   X is in SX and SX only
B)   X is in ~SX and ~SX only
C)   X is neither SX nor ~SX
D)   X is both SX and ~SX

Priest wants to know whether there are any changes that fit into class (D). Consistent theories of motion require us to stick with (A) or (B). Priest thinks (C) and (D) are viable options. The car is either in motion or not in motion, so Priest rejects (C).

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[251] See also Mortensen, 2002a.

[252] Note that our experience of motion and motion itself require separate treatment.

[253] I take it, for present purposes that MX is equivalent and interchangeable with ~SX.

The only reason that (D) usually gets rejected is that answers of type (A) or type (B) are thought to exhaust the answers available.

This problem is, however, a problem about the *origin* of change/motion, not a problem about motion or change in general[254]. We could claim that the origin of change/motion is inconsistent, but that uniform change/motion is consistent, or equally well vice versa. We can, I believe, generalise an account of motion in general from the origin of motion. This generalisation is reasonable because I believe, with Priest, that motion is an example of change. We are getting at inconsistency in change, and if the origin of motion and motion in general are both types of change, then both are consistent or inconsistent together. The way this works is as follows. At time T, X is stationary, but time T is the moment when the driver of the car presses the accelerator and X moves. X, being stationary at T, is at place P. Since time T is also the moment when X moves, it is reasonable to assume that X moves from P to P^1. At time T X is at and not at P, assuming that being at P is inconsistent with being at P^1. This is the origin of X's motion, and involves X being at and not at P. Now look at the case for motion in general. At time T^{+1} X is in motion so, Priest will argue, both at and not at place P^1. The claim for motion in general here is the same claim about the origin of motion. Since the origin of X's movement has significant similarities to motion in general then were we to claim one type of motion to be consistent or inconsistent, it is reasonable to think the other type is too. This is because motion is a form of change, and whether we are talking about the origin of motion or motion in general, the simple view I will adopt here is that if one is consistent or inconsistent then so is the other. I am taking motion to be an example of change, so the reasoning here applies to the distinction between the origin of change and change in general. They are consistent/inconsistent together. From here on I will talk about uniform change/motion. The conclusions will be applicable to the origin of change/motion and change/motion in general.

Priest sets out the consistent view of change as a 'cinematic account' (Priest, 1987, p. 203). Objects like cars in motion occupy different points of space at different times, like frames in a roll of film are next to each other. He attributes this view to Russell, and acknowledges that it is the current received view about change. Priest's objection to this view is that it is an extrinsic view, not an intrinsic one.

Take a simple object, an orange. We can distinguish between properties intrinsic to that orange and properties extrinsic to it. Intrinsic properties *could* include the colour of the orange, its mass and shape. These are properties that do not rely on any other. Yablo characterises this as a property that an object has 'regardless of what may be going on outside of itself' (Yablo, 1999, p. 479). We can take it that extrinsic properties are all the others, such as position, weight, and any properties involved with the interaction of the object and the world. Taking these accounts as a basic understanding of what it is to be an intrinsic and an extrinsic property we can see that the cinematic account of change is an extrinsic one.

Priest wants an intrinsic account of motion. He thinks that an extrinsic account prevents us distinguishing between an object in motion and a series of stages of a stationary object. '[A] journey is not a series of states indistinguishable from states of rest, even a lot of them close together' (Priest, 2006, p. 174). This is the motivation behind much of Priest's work here.

In support of this preference for an intrinsic account Priest raises three arguments against the cinematic view: it makes motion impossible, denies the possibility of change, and rejects out of hand a reasonable view of the world whereby

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[254] I owe this point to Chris Mortensen.

one state is causally dependent upon an earlier state. I briefly set out these three arguments below.

First, Priest raises the abutment argument to show that the cinematic view could not account for the instant of change. This challenge applies only to *discrete* time, which is itself contentious: time may well be dense, if so, then this problem dissolves, partially at least. In a discrete time system S, that system changes from a state, S_0, to state S_1. "Then there must be two abutting intervals, X and Y, X wholly preceding Y, such that S_0 holds throughout X and S_1 holds throughout Y" (Priest, 1987, p. 203). To return to the car example, in such a discrete system, we start with two moments, T and T^{+1}. These are next to each other, such that at T we have SX, at T^{+1}, we have ~SX. Since in discrete time there is no interval between T and T^{+1}, there is no moment between T and T^{+1} when the car can *start*. How, Priest asks, can the car start to move? Since at T the car is stationary and at T^{+1} it is moving there is no moment when the car starts to move. If so, there can be no instant of change within the cinematic view, at least if time is discrete.

Second, Priest thinks that within the cinematic view we could not conceive of objects being in motion, for the cinematic view entails that every object exists in the space that it does and no more. Take the car: Priest thinks that according to the cinematic view, the car stays in the same position in each frame, to employ the film analogy. Because the car fills the same space in each frame, there is no motion at all.

Furthermore, on the cinematic view the car would not be in motion simpliciter, rather it could only be said to be in motion relative to something stationary, e.g. the road. But relative to the car's perspective the road is in motion, the car stationary. Since there is nothing intrinsic to the car it could not be said to be in motion.

It follows from this that at any moment we look at the car, it would appear stationary; so we could not decide whether the car was in motion or not. In each picture of the world given by the cinematic view, we have a motion of the car that is equal to 0. We could not add the 0 motions of the car together to generate the claim that the car is in motion[255]. Priest asks how 'can going somewhere be composed of an aggregate of going nowheres?' (Priest, 1987, p. 218)

Third, the cinematic view rules out, *a priori*, an intuitive account of causation. Suppose that the world is 'Laplacean' (Priest, 1987, p. 217), where any state of the universe is causally determined by previous states of the universe. According to the cinematic view each object's instantaneous position at any moment is *independent* of its position at the nearest moment. '[The] instantaneous state of an object cannot even determine whether it is the same or at a different place at subsequent times' (Priest, 1987, p. 217). There are two ways to take independence here, as metaphysical independence or causal independence. We might think that the 'independent' that has to be rejected by the cinematic view is 'metaphysical independence'. The universe at one stage is the same as the universe at an earlier stage, so not metaphysically independent. However, Priest thinks that the 'independent' promoted by the cinematic view here seems to be 'causally independence'; Priest thinks that the cinematic view requires that the state of the universe at time T, cannot be taken as a cause for the universe at time T^{+1}, since these moments are causally distinct. The universe at T cannot be said to determine the universe at T^{+1}. Return to the analogy with a roll of film. Since each frame has different versions of the same objects there is no requirement that any frame be connected causally to its neighbour. They may just exist next to each other in the way houses on a street exist next to each other. The houses here are metaphysically

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[255] This is a version of Zeno's paradox of the Arrow.

independent of their neighbours (promoted by the cinematic view) but *also* causally independent, something the cinematic view might wish to reject. However, in defence of the cinematic view, we might think that the metaphysical independence here is *not enough* to get causal independence. Each house is independent of the other, but we might still think them causally connected, since for one house to remain stable, the land it is on has to stay stable, and this land connects the houses. I shall return to this later, but suffice it to say that Priest's case here is not watertight. Priest thinks that the cinematic view takes the universe at time T to be just the neighbour to the universe at time T^{+1}, without any causal connection. Priest does not think that the world is Laplacean, but finds that the cinematic view is strange since it rules out the Laplacean world on a priori grounds.

Mortensen, 2002a, points out however that this is a modal fallacy on Priest's part. The Laplacean view is only ruled out when we adopt the cinematic view, so the rejection occurs a posteriori, not a priori. The claim only gets started once we have adopted the cinematic view. We might adopt that view because of empirical evidence, for example. If so then Priest's claim is only relative a priori, not a necessary one.

Priest proposes these three reasons for rejecting the cinematic view of change and motion. It cannot explain how objects are in motion at all, it cannot account for change, and it rules out on a priori grounds alone the Laplacean view of the world. Priest prefers an intrinsic account of motion, and argues that inconsistency is the only available intrinsic account of motion. To develop this inconsistent account Priest follows Hegel, who argued that motion is inconsistent.

Hegel believes we need inconsistency if we are to explain motion. It is not enough for an object to occupy different places at different times, because it could do this whilst stationary. Motion must be intrinsic to objects, and we can *only* explain this if we say that the object both is and is not at a place at a time. Take the car, moving along the street from W to Y. When the car leaves point W, it is yet to reach point X, so it must be at some point in between, say W^1. But this only reintroduces the problem, for there must be a moment when the car is not at W and not yet at W^1. We need another intermediary, but this only reintroduces the problem. To explain how the car moves from W to X we have to say that the car is at and not at W, and at and not at X. To explain *motion* as occupying different places at different times is not sufficient, we need to show that objects are both at and not at a place at a time.

Priest employs Hegel to show that we cannot localise objects in the way that the cinematic view requires. Hegel believed the world to be a continuum, not a discrete collection of space-time points, and argued that we cannot localise objects to times because times themselves cannot be localised. This is highly speculative and Priest introduces it to soften us up for his 'Spread Hypothesis':

> A body cannot be localised to a point it is occupying at an
> instant of time, but only to those points it occupies in a small
> neighbourhood of that time.
>
> (Priest, 1987, p. 221)

The clearest claim we can make is that the object occupies a small spread of locations at any one time. Here we might say that over a spatial interval and at any time, T, B is at P and B is not at P, for all points P in that spatial interval.

What Priest hopes to show with his Spread Hypothesis is that Hegel's concept of motion is superior to the cinematic view. Under the Spread Hypothesis there is an intrinsic difference between a moving and a stationary car. That the world is a continuum allows us to adopt the Laplacean view of the world, should we so wish.

In his (2006) Priest generalises his Spread Hypothesis to time. According to the Spread Hypothesis, we could only locate a state of affairs within a small neighbourhood of time, not some specific time, T. This, Priest claims, is ontological; 'nature itself is such that it is unable to localise precisely its doings' (Priest 2006, p. 213). First, Priest assumes that time itself is a physical magnitude. If so, according to the Spread Hypothesis, we cannot localise time to a specific time T, but only to a time *around* T. '[At] 12 noon it is every time around 12 noon' (Priest, 2006, p. 215, original emphasis). It follows, Priest claims, that time *is* in a state of flux and *is* inconsistent. 'There is only one time, and that, being in a constantly inconsistent state, is in a state of flux' (Priest, 2006, p. 215).

Priest adapts Hegel's theory of motion and the failure of the cinematic view to motivate the inconsistent option (D) as a plausible response to the question of X's state of motion at time T: X is both SX and ~SX. Though I have restricted the scope of Priest's claim in this instance to the origin of motion, we can generalise Priest's claims to motion in general. As I argued above, the origin of motion and motion in general are consistent/inconsistent together. Both are kinds of change, and it is quite reasonable to generalise from a state description of the origin of motion to motion in general, and vice versa. The general claim runs as follows: X is both at W *and* at Y, where being at Y is incompatible with being at W; i.e. X cannot consistently be held to be both at W *and* Y. According to Priest however, X *is* at W and Y.

Motion entails a paraconsistent treatment. We may not be convinced by Priest's arguments here, but what is important for present purposes is that Priest has motivated a need for a paraconsistent approach to motion. He then generalises this account, notably using the Spread Hypothesis, to claim that time itself is inconsistent. I will return to Priest later and argue that his account of motion does not force us to think the world itself is inconsistent. We could use Priest's theory to provide a paraconsistent account of our experience. I want to turn now to look at an epistemological account of the inconsistency of time.

5.   *Paraconsistency and the Model of an A Theory of Epistemic Time*

Recall the model developed in chapter 17, where X is the event of a car passing a bench. We observe the motion of the car and anticipate the car's future positions. We also remember its past positions and combine these in our present perception of the car. Our perception of the car at X involves the conception of it being at previous positions and conceptions of it being at future positions. Combined these work to allow us to conceive of the car simultaneously being at X and *not* being at X: a contradiction. I will argue that this contradiction is cognitive and as such is epistemologically motivated.

At the cognitive level a very simplified model works as follows. The idea of the car, call it the car-idea, passes through a three neuron system A-B-C, representing the information brought about by the car passing a bench. Entering the system imposes properties *and* draws mind-dependent properties out of the car-idea. When the car-idea enters the system, temporal properties of pastness, futureness and presentness become activated. By activated I mean something analogous to sense-data; where our idea of yellow is *activated* by the appearance of The Sun. Drawing upon the analogy with the perception of colour in Part Two, the properties I talk about here could be characterised as temporal-sense-data, which react to the arrival of signals and operate as a result of those signals. Without these signals such properties lie dormant, so require those signals to operate.

With this loose analogy in mind, I believe that when the car-idea enters the cognitive system and passes through A, A activates the car-idea property car-idea^A, when the car-idea passes B we have car-idea^{AB} and when it reaches C, we have car-

idea^{ABC}. We also have, at A, the realisation that the car itself had a position before it entered our system. So at car-idea^A we have the impression that the car was in a position before A, or car-idea$^{\sim A}$. At A, again, we also see the car as passing on to B, giving us car-idea^{AB}, which is inconsistent with the car-idea being at A, since to be at AB is to *have been* at A, but now be at B. This means at A, we have car-idea$^{\sim A}$ and car-idea^A and car-idea^{AB}, three contradictory (cognitive) states of affairs, if the car can *only* be at one place at one time.

When the car turns into the street (W) at T^{+1}, we assume that the car existed before it became a content of our experience. We think of it as having existed at a time before T^{+1}, i.e. at before-W. We also experience the car approaching the bench (X): at time T^{+1} we experience in some way the car as being before-W and at-W and think of it as also moving to-X; the contents of this experience appears to be contradictory. But this inconsistency is within our *experience of the car* and not the car itself. It does not prove that the car is unreal, or that the time when the car is at W (T^{+1}) is unreal. All it means is that we experience the car as being at more than one place at a time. The justification for paraconsistency here is epistemological, not ontological.

Moving to the cognitive level may just move the problem of motion into that level. Suppose that within the cognitive system there is a sequence of personal activated representational states, $S_1,\ldots\ldots.S_n$, each S_i representing the car-idea being in position P_i. For example at P_i the car-idea^A is represented as being at S_i. The car-idea then, to be in motion at the cognitive level seems to be both at P_i at S_i and not at P_i at S_i. The problem of motion is reconstructed at the cognitive level. So either both are contradictory or neither is.

However, the cognitive reconstruction is not a complete reconstruction. Suppose position P_5 is the position of car-idea^{AB} (S_5), at P_4 we have car-idea^A (S_4) and at P_6 we have car-idea^{ABC} (S_6). These representational states are not of a stationary car, but of a car in motion. To get a clearer picture of this think of the car-idea as encapsulated, in Fodor's sense. Fodor (1983) takes certain pieces of information in a cognitive system to be complete, in need of no other information. His example is perception. A belief, for example, relies on external information. My belief that the creature in front of me is a large cat requires input from the senses, from other beliefs, such as a furry, four legged mammal could be a cat, which when combined with the perception of this animal is both a mammal, and a member of the feline family (plus knowledge about what being a member of the feline family requires and so on). However, my perception of this animal does not require access to any further information; I need no further information to tell me that I am seeing an X. Classification of that X is not encapsulated but the original perception of it is. This is because the visual system is 'informationally encapsulated' (Fodor, 1983, p. 67); the result of the perceptual system is independent of other cognitive features, especially desires, hopes etc., to which it has no access. Perceptual information is complete in other words. Fodor supposes that in certain situations, such as being faced by large cats, we would want our perceptual system to identify threats extremely fast. By not needing to search through other cognitive systems, such as the phonetic system, for confirmation relations between the perception of the cat and the belief that the cat is a threat, I am able to recognise and act extremely fast.

The car-idea is an informationally encapsulated idea. The superscript ABC captures the different places that the car-idea *is* in. It is not the case that every representational state represents that car-idea in one position, and we construct the inconsistency from this. Rather the car-idea is represented by that state as being in more than the one place at the same time, when that should be impossible; i.e. the car is represented by the car-idea as being inconsistent. Our perceptual system provides

an informationally encapsulated experience of car-idea[AB], which encapsulates the inconsistent information that the car-idea is and is not at place B.

We have a model of how the mind/brain operates given our experience of events in time. There is inconsistency here, but it is inconsistency within our cognitive system. The justification remains epistemological. One problem for this claim is whether we stick with the epistemological justification for paraconsistency, or are we committed in some sort of sorites way to ontological justification for paraconsistency? If our cognitive system tolerates inconsistency, should we restrict that inconsistency to our experience, or rather is that experience reflective of an inconsistent ontology?

### 6.	*Paraconsistency and Inconsistent Images*

I want to motivate indirectly a paraconsistent account of our temporal and A-ish experience by supporting a paraconsistent account of the experience of impossible images, as proposed by Mortensen (1997, 2002). The success of such an account ought to make us more inclined to accept paraconsistency elsewhere in cognition, and in particular in the theory of perceived change.

We can distinguish between paraconsistent thoughts (*belief* that A is X & that A is ~X), paraconsistent perceptions (*seeing* that A is both X & ~X) and dialethic reality (A *is* X & ~X). Inconsistent images point towards a paraconsistency that is more than a property of thought, but less than a property of reality. I propose that inconsistent images show that our non-verbal experiences can be paraconsistent.

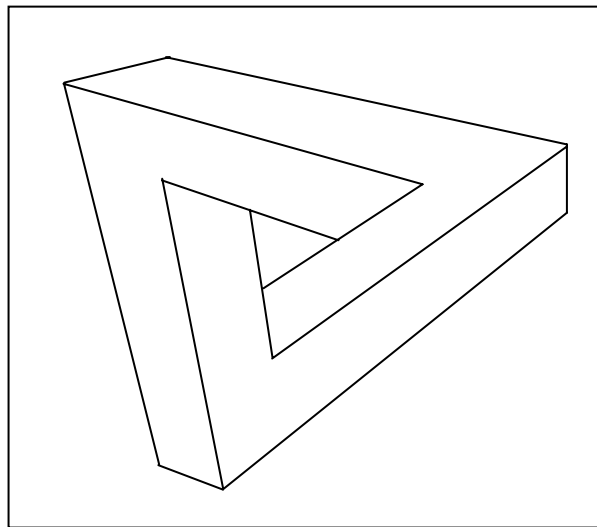Look at an inconsistent image, such as the Penrose Triangle:

Fig. 1.

This represents an apparent impossible object in a two-dimensional plane. In three dimensions, such an object cannot exist. Yet, we seem to see it. When we see this inconsistent image, do we think of the image, considered as an intentional object (or 'intentional triangle') as inconsistent when it really is consistent? Do we *see* the triangle *as* inconsistent? Or is the apparent object itself inconsistent?

One response to impossible images is to claim that we do not experience an inconsistent thing, we merely put it together in our minds/brains *as* inconsistent. The three consistent images (Fig. 2.) are combined to form the inconsistent triangle. Moving these consistent images closer together creates the mental experience that the picture is of an inconsistent object (Fig. 1.).
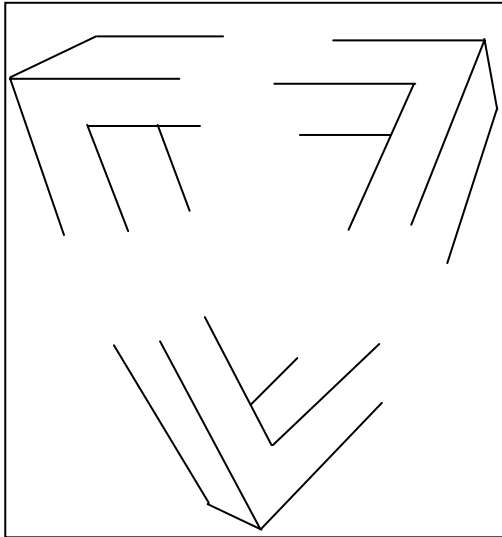
Fig. 2.

What we are really looking at is a picture of a disassembled object, without seeing that the lines of the object are not connected. The three parts of the object can be aligned so that we *see* them as joined as in Fig. 1. Why is it then, Mortensen (1997) asks, that we seem to see an *impossible* object and not a *collection of possible* objects? Why do we see the object as impossible, rather than possible? To be experiencing it as three disconnected parts we would need an account of why we fail to see that the parts are not actually connected, even though in the picture they are.

If inconsistency were restricted to verbal based thoughts then this would be insufficient to explain our experience of inconsistent images, which is a combination of the verbal *and* non-verbal. Recall Fodor's informational encapsulation. The perception of the Penrose triangle seems to be independent of our beliefs and concepts of the triangle. It appears to *be* inconsistent yet we believe/know that we cannot, as a result, *see* it. Fodor applies this thought to the Muller-Lyre illusion.

> The very same subject who can tell you that the Muller-Lyre
> arrows are identical in length, who indeed has seen them
> measured, still finds one looking longer than the other.
>
> (Fodor, 1983, p. 66)

Fodor concludes that the Muller-Lyre and other persistent optical illusions (including the Penrose triangle I suggest) are encapsulated. The background knowledge that the lines are the same length, that the triangle cannot exist in three dimensions, are inaccessible to the perceptual mechanisms at operation. It follows that no amount of verbal information can stop the perceptual system being 'fooled' by such illusions.

The inconsistency of non-verbal experiences makes clear the attraction of the A Theory, I suggest. If inconsistency is purely verbal then experience of the Penrose Triangle would involve adding together (verbal) thoughts to construct an inconsistent *verbal thoughts*. But seeing the image is an *experience*, not a thought *about* that experience. We do not merely think that we see an inconsistent image. We seem to *experience* the image, and this experience is non-verbal[256]. The inconsistency of the triangle seems to be part of the experiences our thoughts are about. Only this seems to explain why we actually *experience* the triangle as inconsistent.

There is a sense where we can perceive consistent objects as *being* inconsistent. Our experience is inconsistent, but there is no claim that reality itself is

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[256] Of course, at a trivial level, we do think we see the image, since we see it and account for it in our thoughts. But the inconsistency here does not *solely* lie within our (verbal) thoughts.

inconsistent: we simply *experience* the triangle as being inconsistent. It follows that the paraconsistent treatment required here is (non-verbally) epistemologically motivated. With the inconsistent image the lines of the dissected figure are mentally joined. Suppose we create a three dimensional figure (Fig. 3). This is a possible object but when we to look at it from a particular perspective we would see it as impossible (Fig. 1). Indeed, it can even be photographed from an angle such that it appears to be a photograph of an impossible object looking like Fig. 1[257]. When we adopt the appropriate perspective, the lines which show the figure to be consistent somehow merge with the rest of the figure to make us see it as being inconsistent. The point here, however, is that when we adopt such a perspective, we *see* the object as being inconsistent. The object itself is clearly consistent, for the majority of perspectives we can adopt show that it does exist.
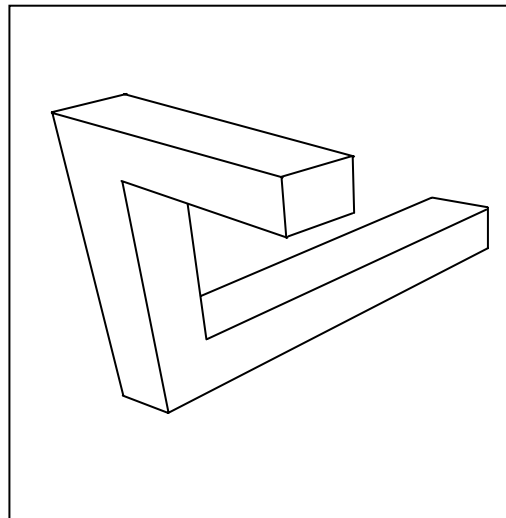

Fig. 3.

One possible explanation for this is that when we see the object, our focus somehow shifts between thinking that the left hand side of the triangle (A) lays over the right, and then moves to the perception that the right hand side (B) overlaps the left.
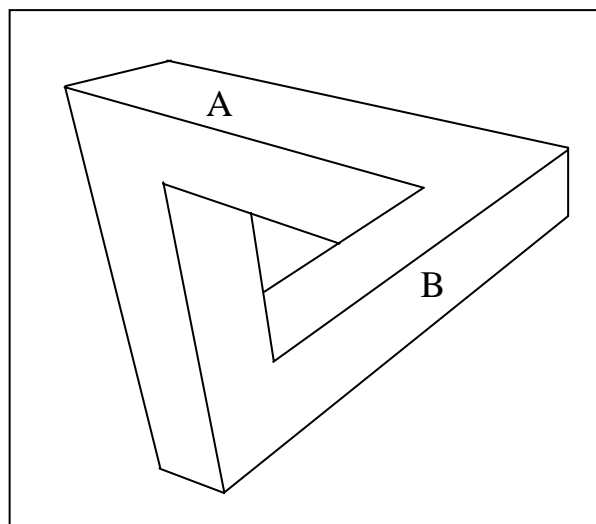

Fig. 1a.

This implies that we do not see the object in one single perception. This is phenomenologically implausible, for I do look at the triangle and experience the

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[257] See Mortensen, 2002, for example.

whole triangle. Mortensen (2002) argues that only an inconsistent theory can account for the fact that the content of the experience is of an impossible object[258]. Any attempt to construct a consistent description of that content fails to capture the fact that we see the whole triangle in one gestalt moment.

The experience of inconsistent images such as the Penrose Triangle may attract us also to *ontological* paraconsistency. But this needs an extra argument. Mortensen (1997) thinks we ought to at least entertain the possibility that inconsistent objects exist. Priest (1987) argues that the motivation for the development of paraconsistent logic is the fact that there are true contradictions, so prefers the ontological justification. But if we restrict our experience of impossible objects to the cognitive level, i.e. adopt the non-verbal epistemological justification for paraconsistency, then the claim that inconsistent images inclines us towards the existence of inconsistent objects does not force us to conclude that reality itself is contradictory.

I have motivated a case to support a paraconsistent account of the experience of impossible images, as proposed by Mortensen. I believe that the success here points towards a motivation for a paraconsistent account of our A-ish experience. We could call this an experiential justification for paraconsistency[259]. By looking at inconsistent images we have looked at a way of developing paraconsistency that is more than logical paraconsistency but not metaphysical paraconsistency. We can, therefore accept the claim that our experience of motion, of inconsistent images and of time involves contradictions and paraconsistency, without drawing Hegel's conclusion that reality itself is inconsistent.

7.   *The Waterfall Illusion*

Crane (1988) draws similar conclusions from an effect brought about by observing motion, *then* stability. This is the Waterfall Illusion. Crane's analysis suggests a need to recognise the paraconsistency of pre-conceptual experiences. Look at a waterfall for an extended period of time then turn your attention to a stationary object, a stone. The stone appears to move *and*, relative to the background of the scene, appears not to move. Crane believes the phenomenology of the experience of these contradictory states disproves the claim that such illusions occur at the level of thought[260]. Crane's actual target is the claim that we need a concept, which can be either verbal or non-verbal, to have such an experience. Crane thinks the apparent motion of the stationary stone is something we have pre-conceptual access to[261]. In other words we have access to this experience before our concepts of motion and stationary come into play.

Crane believes that when we look at the stone, we do not think of it as either being in motion, or being stationary, we *see* it as both. We do not see it as stationary, then in motion, then stationary, we see it as *both*. '[The] Waterfall Illusion is precisely a case where a scene looks as if it is both one way and another (incompatible) way at the same time' (Crane, 1988, p. 145). Crane uses this example to motivate the conclusion that concepts are not involved in perception, but whatever we make of this, his case is relevant to a general claim that *experiences* can be inconsistent. In fact, Crane claims that in specific cases such as the Waterfall

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[258] Mortensen, 2002, p. 451.

[259] This description I owe to Greg O'Hair.

[260] I will take thought here to be a verbal entity, like a belief that p.

[261] Crane thinks a concept can be verbal or non-verbal: for a concept is the representational content of experiences. Crane thinks a concept is what allows us to verify the truth, existence etc., of our expressions. '*F* and *G* are different concepts if it is possible for a subject to rationally judge, of an object *a* that *a is F* and that *a is not-G*' (Crane, 1988, p. 144).

Illusion, the 'content of the *experience itself* is contradictory' (Crane, 1988, p. 144, original emphasis)[262]. A subject (perceiver) can be ascribed a single experience with contradictory contents[263].

Mellor (1988) rejects Crane's claim that we see the stone as moving *and* stationary. Rather what occurs is that two mechanisms for motion recognition conflict. We observe that something is moving, and we also observe when something *has* moved. When we look at the waterfall, we see that the water *is* moving. We also see that the water at the bottom *has moved* from the top. Mellor thinks that these two concepts, moving and having moved, have their own mechanisms within the perceptual system[264]. Our concept of 'having moved' is, Mellor believes, one way we observe motion; we see that an object *has* moved, without actually seeing it move. We also see instantaneous motion, where a moving object catches our attention when a stationary one would not. When we see an object move, we also come to believe that it has moved; it also inclines us to believe that the object is moving. The perception of motion involves two concepts: instantaneous motion, and having moved. When we transfer our attention to the stone they conflict. These two mechanisms, which incline us to believe either that an object is moving or has moved inclines us to believe that the stone is moving and is stationary[265].

Mellor believes that concepts, which could be implicitly verbal, are involved in perception; our observation that the stationary stone is moving involves first the belief that it has moved and then the belief that it is in motion. Mellor believes that our perception of objects inclines us to believe one thing over another. But this inclination is filtered by pre-existing beliefs. New experiences do not automatically produce new beliefs because the new information may conflict with a pre-existing and better entrenched belief. 'The experience has the content of the belief, but may not produce it' (Mellor, 1988, p. 149). Stronger beliefs in the system defeat the new beliefs of the experience; the content of our belief is the movement of the stationary stone, but the motion has been generated by a pre-existing belief. Mellor's explanation seems to be that our pre-existing belief that there is no motion overrides our perceptual belief that the stone is in motion.

Mellor's explanation does not obviously contradict Crane, it just provides a mechanism to explain the workings of the mind/brain that allows us to see the contradiction. Mellor's account is implicitly consistent, since he seems to think that the illusion comes about when two independent mechanisms come together and fail. It could be the case, even under Mellor's account, that we have an inconsistent concept of a stationary moving object; such as a car that is just pulling away from the curb.

Crane argues that since the perception of the stone as moving *and* stationary is simultaneous, this inclination suppressing prior belief does not exist and could not do the work Mellor wants it to. This is where Mellor brings in his claim that perception of motion involves different mechanisms to the perception of non-motion and that these mechanisms conflict. But Crane argues that if Mellor is right this cognitive dissonance would soon resolve itself: once we became inclined to believe one thing, motion, over another, immobility, the Waterfall Illusion should dissipate. He believes that the illusion does not disappear.

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[262] Crane distinguishes this from illusions such as the Muller-Lyer illusion, where the contents of intentional states seem to conflict; our belief that the lines are the same length conflict with our perception of one line as being longer than the other.
[263] Crane, 1988, p. 145.
[264] Mellor, 1988, p. 150.
[265] Mellor, 1988, p. 150.

I will leave the debate here, and set aside any judgement about which account is correct. For present purposes it is sufficiently clear that the claim we experience inconsistent images at the perceptual level is at least reasonable, and we have a rough and ready understanding of what that account might be. Both Crane and Mellor think that the Waterfall Illusion shows that we have experiences of inconsistency; the debate is about how we might explain that experience.

I have to say that I'm not convinced that the Waterfall Illusion is obviously inconsistent. The reconstructions I have observed have certainly involved the perception of a stone moving when we know that it should not be. I have not yet observed the stone moving and remaining still[266]. Other representations are more hopeful, but I think it still a stretch to claim that you see something move and stay still[267]. Perhaps the debate here is informed by better representations, or misinformed.

Assuming that the representations I have had access to have been inaccurate than the debate here helps motivate the thought that we do have experiences of inconsistency; we have an experiential justification for paraconsistency. If this assumption is wrong then we have one less justification, though I think inconsistent images and motion are justification enough. I have looked at two inconsistent problems: our experiences of impossible objects and the Waterfall Illusion, and I have done this to motivate the claim that our non-verbal experiences are inconsistent[268].

8. *Inconsistent Experience and Motion*

Having looked at ways to construct paraconsistency as a feature of our experiences, I will briefly revisit Priest's (1987) ontological justification for paraconsistency. Priest claims that to be in motion is to be in more than the one place at the same time: an ontological justification for paraconsistency, since reality is inconsistent. We might try to resist this conclusion on three counts. First, the cinematic view, on one account, *is* compatible with the Laplacean view. Second, the cinematic view can accommodate the experience of change and motion without ontological commitment. Third, Priest prefers an intrinsic account of motion, but his theory is really a paraconsistent extrinsic account. A preference for intrinsic change does not motivate paraconsistency. I will set out these charges below, and conclude that we can accept that the contents of our experiences of change and motion are inconsistent without recourse to the ontological justification for paraconsistency.

First by turning to the endurantist versus four-dimensionalist distinction we can show that the cinematic view can be compatible with the Laplacean view; the Laplacean view being that every state of the universe is causally and temporally connected to earlier and later states of the universe. According to four-dimensionalism objects and events are spread out in time just as they are spread out in space. When, for example, we refer to a car, the whole of that car is not present at one time. The car's identity involves its extension in space *and* time. In contrast, endurantism is the view that objects *are* entirely present at each time they exist and pass through time. The car exists at one moment, and then exists at a later moment and so on. This distinction can be applied to the cinematic view. I will show that

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[266] See http://www.lifesci.sussex.ac.uk/home/George_Mather/Motion/MAE.HTML,
[267] See http://www.opticsforteens.org/illusions/waterfall.asp
[268] Chris Mortensen (in conversation) has pointed out that sooner or later we are going to have to point to the exact point where the inconsistency occurs. At present when we have inconsistent experiences (p & ~p) the (~) *is* verbal. I think perhaps that this (~) has more to do with our descriptions of these contents, and descriptions are verbal, but it would be strange to think the description was *all* there was to our experiences. We have experiences and describe them, two different realms.

Priest's take on the cinematic view is implicitly at least an endurantist interpretation of that view. Every object exists wholly at each position in time, such that the Laplacean view fails. I will argue that a four-dimensional account of the cinematic view is compatible with the Laplacean view.

Priest's target is the cinematic view; that motion consists in an object being in one place at one time, and another place at a different time. This is implicitly endurantist, for the *whole* of the object is in one place, and then the next. However, a move to four-dimensionalism can show how we can construct the cinematic view in a different way. I suggest that the four-dimensional view is a logical extension of the cinematic view, but with continuity built in. Here each moment *is* connected to the next, because the objects and events at one moment in time *are* connected objects and events around them. Take a table; at any place only a part of that table is spatially present. We say one place is related to the next because for a table to exist it has to exist across space. Four-dimensionalism holds that this view applies to the temporal spread of objects. The whole of the table is spread out across time, as it is spread out across space. If so, then the cinematic view does not *automatically* rule out the Laplacean view, it is the endurantist account of the cinematic view, where each object is present wholly in each frame that is the problem. The Laplacean view only gets rejected on Priest's account of the cinematic view, because each moment is causally unconnected to those closest to it. But if certain objects exist across space-time, this reintroduces the causal connection Priest thinks the cinematic view rejects. If we turn instead to four-dimensionalism, we can hold the cinematic and the Laplacean views: objects are spread out across space-time and causation is spread through these connections. The cinematic view *can be* compatible with the Laplacean account of causation.

Priest claimed that the cinematic view could not account for motion. This might be true, but denying motion and change is not denying that we experience motion and change. Our experience of the Present Moment extends across time, such that our experience of the car is of it being in different places at different times. We do not have an experience of the car being at W, then an experience of the car being at X and so on. At time T and place X we experience the car as having been at place W at T^{-1}, being at X at T *and* about to be at place Y at T^{+1}. Our experiences of the world are extended in time, thus connecting frames in the cinematic view. This means that were the cinematic view correct, and there really *is* no change and motion in the world, our *experience* would still be of change and motion. It is our non-verbal experience that is inconsistent. This means that Priest cannot use our experiences of change and motion as a prima facie *ontological* justification for paraconsistency. He still needs to provide an argument for that.

The cinematic view can then be compatible with the Laplacean view and it can explain our experiences of change and motion. This leaves us with Priest's final argument against the cinematic view: that it cannot account for an object to be in motion simpliciter. The extrinsic nature of the cinematic view seems to rule out the possibility of motion and change independent of our experiences: making change and motion mind/brain dependent. Priest argues that an intrinsic account gives a simple account of motion. However, I argue that Priest is confused, for his account is as extrinsic as the cinematic view.

To see how Priest's view is just a different extrinsic view, consider Zeno's Paradox of the Arrow. An arrow is in motion. Focus solely on that arrow. If change is intrinsic, there must be a way of looking at the arrow itself such that we can tell whether it is in motion. But there is no obvious way of distinguishing an arrow that is in motion from a stationary arrow. Priest claims that the arrow moves because it is both at one place and not at that place. The arrow is in motion precisely because we

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cannot localise it to a specific place at one moment in time. The best we can do is say that the arrow is in one spatial interval at that time.

This talk of being in more than one place at one time is extrinsic to the arrow: it describes the motion of the arrow through its relation to multiple places. Priest's account is thus an extrinsic view of motion, *not* an intrinsic view. If so why reject the cinematic view on the grounds that it is extrinsic? Priest adopts Hegel's view because 'Hegel did hold a state of motion to be intrinsic: there *is* an instantaneous difference between a moving body and a stationary one' (Priest, 1987, p. 219, original emphasis). Priest believes motion is inconsistent because at any moment an object can be taken 'both to be and not to be in some places' (Priest, 1987, p. 224). This is just a paraconsistent extrinsic view, not an intrinsic view that forces us to take a paraconsistent view. The mention of places means that the property in question does involve the world around the object and fails to meet our criterion for being intrinsic. To be intrinsic is to be party of an object without regard to the world outside. To be and not be at a place shows regard to the world and fails this intrinsic test. As such, Priest's requirement of an intrinsic account cannot be satisfied by his own account.

Priest might have three responses here. First his account is intrinsic to an object at a time. Second, objects in motion possess intrinsic relational properties, which entails that those properties are intrinsic. Third, even if his view does turn out to be extrinsic, it is still a better account than the cinematic view. I will argue that Priest has no grounds for reasserting his intrinsic claim.

First, Priest presents his account of an intrinsic property. Priest largely follows Hegel who argued that the cinematic view was applicable to motion but, on its own, is insufficient for motion. An object being in two places at different times 'would not distinguish it, for example, from a body occupying different places at different time, but at *rest* at each of these instants' (Priest, 2006, p. 175, original emphasis). The cinematic view is part of the picture of motion but it is not enough. We also need an intrinsic aspect. Priest offers is a concept of intrinsicness of motion based upon the spread hypothesis. Priest's 'intrinsic property' comes out as an object that cannot be localised to a place, P, at time T. Call this an I Property, and occurs in an object that is at and not at P at time T.

However, I find this account of an intrinsic property a little obscure. Above I characterised an intrinsic property as one that an object has independently of how that object is related to the world. On a prima facie level the I Property does not count *as* an intrinsic property, it has a relationship with the world built into it. However, what we want to do is show that we have more than definitional problems with Priest's account. I do, though, feel that we need an account of what it is to be an intrinsic property that could accommodate I Properties, if we are to accept this account.

I Properties are those that are in objects in motion and involve these objects being at and not at a place P at time T. I am confused about how such a property can count as intrinsic. Take object O to be in motion. O has an I Property. Object O has an intrinsic property related in some intrinsic way to where object O is and also to where object O is not. We could, I think, just get to grips with the position of object O being intrinsic to it. I find the concept of object O having an intrinsic property involving a place where object O is not, confusing. Further, Object O's not being at place P is derived from a deeper, undischarged premiss that O is also at place P^1, and this *is an extrinsic* property. Object O, being at place P and place P^1, means first that P is not P^1, second that being at P means you cannot be at P^1, and third, symmetrically, being at P^1 entails O cannot be at P. But this assumption entails that the account is about being at more than one place. Priest's claim is that at time T, O

is at and not at place P. But to be at not-P assumes you to be at place P^1 and that P is not P^1. If so, then Priest cannot rescue his intrinsic claim, it remains extrinsic. So Priest's account is no more intrinsic than the cinematic view.

Priest could respond that since Object O is in motion we cannot separate the 'is at place P', from the 'is not at place P'. An I property is the basic block; we cannot break it down any further. To understand what it is for Object O to be in motion we have to understand that O is at and not at place P. This certainly sounds like an intrinsic property.

I am still confused however, about how place can be intrinsic to objects. Our ordinary definition of intrinsic, as I have said seems incompatible with Priest's account. Priest has not given us a definition of intrinsicness in general. He has just presented what I have been calling an I Property as an example of an intrinsic property. What we need now is an account of intrinsic properties in general that does not conflict I Properties. Until we get clarification I suggest that we favour the standard interpretation over Priest's. Priest's intrinsic property needs to explain how 'place' can act as an intrinsic property. Until then I suggest that Priest's account be noted but not endorsed. We need a clear account of how an object can have a property intrinsic to it that is not spatially coincident with it. Object O is not at place P yet place P is intrinsic to object O. We should not reject Priest's account merely on the grounds that it is incompatible with our ordinary conception of what it is to be an intrinsic property. We should get clarification

Second, Priest could hold that the moving Object O has inconsistent relational properties. O has the relational properties 'being at P' and 'not-being at P', where you cannot have both consistently. These relations are intrinsic to O. However, were O to have these properties could we tell just by looking at O? Could we identify a relational property by looking only at one of the relata? Priest could save his intrinsic account but would then have to solve the epistemological problem; O is intrinsically in motion but we cannot tell that it is. The trouble is that we do see objects such as cars move. This escape fails, I suggest.

Third, Priest could respond that even though his view is as extrinsic as the cinematic view it is the better account of motion and change. Objects move and change independent of our minds/brains. If so, we can only account for this if we take the paraconsistent route, not the cinematic route. This move is tempting, but one we might want to resist. At present we have no reason to infer from inconsistent *experiences* that the world is inconsistent. Priest makes this inference but needs to show that our experience counts as evidence for such a move.

I have revisited Priest's theory in light of the considerations developed out of inconsistent images. I believe that we can adopt the cinematic view and still provide an account of our non-verbal experience of motion and change. Such a move also applies to time. Having developed an inconsistent theory of motion (change) Priest concludes that 'Dialetheism allows time to be both inconsistent and real' (Priest, 1987, p. 226). In his (2006) he generalises the Spread Hypothesis *to* time, to show that if time is a physical magnitude then it cannot be localised to a specific time T and is inconsistent. I turn later to look at this manoeuvre, and will conclude that we need not adopt this view either. Before that however, I wish to set out in greater detail the experiential justification for Paraconsistency.

9. *Paraconsistency and Time*

I have motivated the availability of a paraconsistent treatment of some experiences by supporting Mortensen's claims about inconsistent images and Crane's views on the Waterfall Illusion. Restricting paraconsistency to our non-verbal experiences can resist Priest's push for ontological paraconsistency. I will argue that

our experience of time is relevantly like our experiences of impossible objects and change/motion. My experience of event X is of it being embedded within a flow of time: within the A series. Here events are experienced as past, present *and* future. I do not think of event X as being in an A series; rather I *experience* it as being within an A series. This experience is inconsistent and needs a paraconsistent treatment.

A car drives down a street, through three positions: W X, and Y. At X I experience the car as 'having been W'; as being at X; and that it 'will be at Y'. Our experience of the car is of it having these three properties. As we saw from Chapter 17, we need a theory that takes these properties to be brought about cooperatively between the system and its contents. The experience of X having past, present and future properties involves a relation between the system and the content. When we experience X, we *experience* it as being buried in an A-ish time, we do not merely think of it as being in A-ish time, just as our experience of the Penrose Triangle is something we experience, not something we *think* we experience. If we are to explain the richness of our temporal experience we need an inconsistent theory of our experience.

Our experience of temporal inconsistency is no proof that reality is temporally inconsistent. The claim that reality is temporally inconsistent requires systematic support. That we experience an A-ish time that is contradictory could be taken as a first step in the claim to dialetheism. This is a possible response available to the A-theorist. But a move to an inconsistent theory of our temporal *experience* can block any such ontological commitment. Our inconsistent theory ought not multiply inconsistencies beyond necessity.

10.   *Phenomenological Inconsistency*

Before shoring up this claim by looking at Callender's analysis of the results of cognitive science I want to briefly look at a phenomenological difference between inconsistent images such as the Penrose Triangle, and the inconsistent experience of motion. The former are visibly inconsistent. Our perceptual experiences are informationally encapsulated: we *see/experience* them as inconsistent. However, when we see a car in motion we do not see or experience it as visibly inconsistent. Rather we conclude that it must be because consistent accounts fail. This suggests that the experience of motion is not informationally encapsulated, but informationally open. This needs further work and I do not intend to develop this much further here, but would suggest an explanation for this phenomenological difference. It is possible that since we have relied upon the perception of motion to survive, that our system has evolved to deal with the inconsistency by removing the visible inconsistency. Seeing the inconsistency would create doubt and may have entailed hunting failures for example. To hit a moving target a hunter needs to see that an animal will be at place P. But if the hunter sees that the animal will be at P and not at P then his aim may fail. Whereas our survival has not depended on seeing Penrose Triangles in a consistent manner, so no such correcting mechanisms are required.

How does this sit with my claim above that we do see the motion of idea-car as being inconsistent? Whilst this may seem to contradict my earlier claim that we experience the car-idea as being at and not at place P, this is only a semblance. The phenomenological concern here is that we see Penrose triangles as visibly inconsistent, but see motion as visibly consistent, then inferring the inconsistency. The solution to this apparent incompatibility within my theory is that seeing the car as being at three places at once does not include seeing it as being at inconsistent places at the same time. To see motion does not mean to see inconsistency.

To flesh this out I think we need to modify the concept of information

encapsulation as derived from Fodor. Fodor thinks that the perceptual *system* is informationally encapsulated. The system is independent of other cognitive systems for reinforcing the results of the system; what we see does not rely on wishes, beliefs etc. The results of that system do not need to be confirmed by other cognitive systems, but it does not follow that these results are encapsulated *within* the system. Nor is it the case that the information within the system is not used by other systems. It is possible that the information provided by the system is complete, but also possible that the information is incomplete, it requires other visual information. If so, I suggest that the perceptual system can produce information which is rich or poor. By rich I mean perceptions with a significant amount of perceptual information, enough for us to make a quick decision. So when I see a Penrose Triangle, the information is enough for me to see that it is inconsistent; I see something which I should not be able to. This 'should not be able to' is something inferred by other cognitive systems from the significant amount of information provided by the perceptual system. The image provides all the information for such a conclusion, so is 'information rich'. When I see the motion of the car, the information provided is poor; a single perception is not enough to provide conclusive evidence for the other systems; to get that information the system needs to provide more information. I do not see 'something I should not be able to'. I see motion, but then come to be convinced, by other cognitive systems which put these perceptions together, that the thing (motion) I am seeing ought to be impossible. This is consistent with Fodor's claims since the perceptual system is not distorting the results because of other systems, but internally. The system is informationally encapsulated, but not all the information it provides is internally (to that system) encapsulated. Some perceptions will be rich, others poor.

Above I suggested an evolutionary explanation. To see the movement of animals we need to be convinced that the animal will be at place P at time T, so that I can strike the animal with some weapon, gain food, thus helping survival. To see the animal as at P and not at P at time T could detract from the success of finding food. The suggestion here is that we have evolved with a perceptual system that deals with inconsistent motion by making it appear as near as consistent as possible. So the inconsistency of my perception of objects in motion is minimalised by the system such that we do see them in two places at time T, but that being at one place is not visibly inconsistent with being in another. Consider also that we ourselves move which means, following relativity, that we see our environment as moving. To be sure that the branch I am about to move to will be there when I arrive my motion, thus the motion of the branch, gets normalised (assuming normal is consistent). A little inconsistency is required since we have to see motion to make adjustments to our own actions etc. I may need to see that a cat is a threat quickly, but I also need to see where that cat is at any point of its movement, so consistent, 'informationally poor', information accompanies the 'informationally rich' information about the threat of the cat.

Whilst this is a highly speculative response I think it a reasonable explanation for why we see impossible objects like the Penrose Triangle as obviously visibly inconsistent and things such as motion as visibly consistent. Our survival depends on being certain that we can deal with motion, so our perceptual system provides informationally poor representations to remove the visible inconsistency included in informationally rich experiences such as those provided by the Penrose triangle.

11.   *Different Types of Impossible Images*

This points towards a need to distinguish between types of perceptual impossibility. By perceptual impossibility I mean the consistency of what we see. A first run through suggests that there are three types of perceptual possibilities:

1. Visibly Consistent; much of what we see is consistent, a tree is obviously and visibly consistent. That something is visibly consistent does not entail that it *is* consistent. This points to sub-distinctions to which I will turn shortly.
2. Visibly Inconsistent; some things we see we should not be able to see; we see that an object cannot possibly exist. The key example here is the Penrose Triangle. We see something that cannot exist in three-dimensional space, yet we see it, and see the inconsistency. That something is visibly inconsistent does not entail that it is inconsistent.
3. Visibly Un-decidable; our visual experience is neither obviously consistent nor obviously inconsistent. That something cannot be decided solely on the way it looks does not entail that we cannot decide whether it is consistent or inconsistent.

These three distinctions give us a starting point. Within these distinctions we can make further distinctions:

1a.   We see a Visibly Consistent object/event that is consistent; the visual consistent image is an image of consistency. A tree is visually obviously consistent *and actually* consistent. We have no reason to suppose that objects such as trees are inconsistent.
1b.   We see a Visibly Consistent object/event that is inconsistent; the image is a consistent image of inconsistency. The perception of motion is visually consistent, but Priest thinks we have good reason to think that motion is inconsistent. If we accept Priest's claims, then the fact that the phenomenology of observing motion involves a consistent image suggests that there are inconsistent experiences that appear consistent.
2a.   A Visibly Inconsistent object/event that is consistent; we see something as inconsistent when it really is consistent. For example, from a certain angle we might see a normal triangle as a Penrose Triangle. Upon further examination we see that what looked impossible actually is possible.
2b.   A Visibly Inconsistent object/event that is inconsistent; we might see a Penrose Triangle. Continued observation of the object fails to remove the inconsistency.
3a.   Visibly Un-decidable and consistent. An image that cannot decide the issue where the object/event is consistent. Here we have an image that cannot guide our decision about the object/event's consistent status. We have other reasons for thinking that the object that grounds the image is consistent: whether this be theory or some other rational explanation.
3b.   Visibly Un-decidable and inconsistent. An image that cannot decide the issue where the object/event is inconsistent. The image cannot guide our decision but some theory, or other reason, suggests or convinces us that it is inconsistent.
3c.   Visibly Un-decidable and intransigent. An image that cannot decide the issue where the object/event is itself un-decidable. The

image cannot decide the issue and no theory or explanation can adequately explain it either.

These distinctions will just help us clarify some basic differences between types of impossible perceptual images. A Penrose Triangle falls under 2b, and motion under 1b, for example. This will help us to understand the differences behind the phenomenology of the two. These two cases do suggest that we can see something that appears consistent but explained best by invoking inconsistency. We also see inconsistency and require an inconsistent explanation. Other inconsistencies could be normalised.

I need to say a little more, however, about the role of reality and the role of theory where inconsistency is concerned. To accept Priest's theory we need to be convinced by more than a theory. To accept my resistance of the ontological implications of his theory we need to be convinced by something less than reality. What we ideally require is that there be room for inconsistency in perception not derived from theory or reality.

An example of a theory motivated inconsistency is the theory of motion proposed by Priest. Here the phenomenology is consistent yet the theory that is the best explanation for motion involves motion being inconsistent. Reality itself does not obviously decide the issue so we resort to a theory.

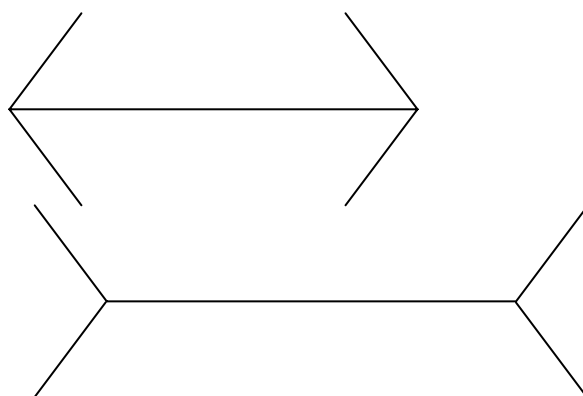An example where reality does decide the issue is the Muller-Lyer.

Fig. 4.

In Fig. 4., we see two horizontal lines sandwiched between pairs of angled lines. The top line looks significantly shorter than the bottom line, yet they are the same length. To find this out all we need do is measure the lines. Once measured and convinced that the lines are the same length we still see the top line as shorter then the bottom line; but we recognise it as an illusion because of the measurement. We know then that our perceptual system is being fooled by the angled lines at each end. Whilst this is not an inconsistent example, it shows that the status of an image gets decided by the measurement, something not open to perceptual illusion.

An example where neither theory nor reality can decide the issue is, I believe, the Penrose Triangle. The geometry of three-dimensional space convinces us that the object cannot exist. No theory can explain how we can see an impossible 3D object when represented on two dimensions. Yet we see the object. Unruh (2001) thinks that on occasion a shift in our attention from the left to the right of the figure can bring about an illusion. The ambiguity lies in depth perception, Unruh claims, since our perceptual system is not given any clues, it cannot decide what it is looking at[269]. Unruh's claims explain the perceptual mechanisms involved, but do not give us a theory to convince us that the object is inconsistent; we don't need a theory, we see

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[269] Unruh, 2001, p. 50. The example Unruh is talking about here is space forks or the devil's triangle; where we cannot decide whether a fork has two or three prongs.

that the object is inconsistent. Nor can this claim to mechanism invoke reality to resolve the issue, since it only highlights the mechanism, not the observation. Our perceptual system delivers an image of an inconsistent object.

Given these distinctions we can see that there are many different ways to classify inconsistent images. In all cases, I think, experience should not be taken on face value as a guide to reality. If Priest is right about motion, then what looks consistent actually may not be. We ought not take this thought too far, since we need to be convinced first that a consistent explanation fails, and that an inconsistent one succeeds. Also, what looks inconsistent might well be consistent. That the top line in Fig. 4., looks shorter than the bottom line is inconsistent with it being the same length, though it *is* the same length. Relying on experience to guide our measurement in the Muller-Lyer case would be a mistake. Distinguishing between types of inconsistent images just helps us get a better grip on this.

12.   *Callender's Subjectivity of the Present*

Callender (2006) thinks that experience acts as a poor guide to the structure of time and suggests ways that the mind/brain might manipulate our experiences. Callender comes at it from the perspective of neuroscience. He argues that when we actually examine the evidence we ought not think that our experiences do reveal a tensed ontology. One of the main arguments he employs is the problem of multi-sensory synchronisation. Suppose that a friend speaks to you from some distance across the room. You see the lips move and that movement is simultaneous to you hearing the words spoken. This synchronisation occurs even though the light travelling from your friend's face travels at 300,000,000 metres per second and the sound made by your friend travels at only 330 metres per second. The sound arrives much later than the sight, yet your experience is synchronised. What occurs is that the visual processing system of the mind/brain is much slower than the auditory processing system. The mind/brain compensates for the differing times of arrival of sensory experiences. If so, then this suggests that our experience of the present has been mediated by the mind/brain.

What this does not show, however, is that your friend spoke at different times. The mind/brain may compensate for the different speed of sensory input, what it does not do is compensate for the generation of that sensory input. Suppose your friend says 'hello'. He says this, and moves his lips saying it simultaneously. That the sound and sight travel through different media and your mind/brain compensates for this does not show that your friend's action was not synchronised. Other experiments suggest that Callender's criticisms are accurate. He quotes Sugita and Suzuki (2003) who showed that the mind/brain takes the velocity of sound into account when judging simultaneity. Lights were placed at various distances but calibrated so that the intensity of the lights appeared identical. Subjects were broadcast white noise for 10ms through headphones to simulate sound broadcast from the direction of the lights. Subjects were asked to judge which came first, light or sound. The data was used to determine a point of subjective simultaneity for each individual. This point of subjective simultaneity increased by 3ms for every 1m increase in distance. As sound travels at 3ms per metre at ground level and room temperature Callender concludes that these findings support Sugita and Suzuki's claim that the brain takes the velocity of sound into account when judging simultaneity. The brain recalibrates sensory input to take account of distance. Even though the lights appeared at the same intensity, the subject's brain recalibrated the sound and the sight to account for a distance not obviously apparent to them.

Callender quotes a number of other experiments to challenge the idea that our temporal experience is indicative of temporal reality. Much of this work supports the

conclusions drawn from the phenomenological examinations of Part Two. Callender explains the phenomenology through neuro-science whereas I remained within phenomenology. What his work develops is an account of ways that the mind/brain works on signals entering the system to generate the experiences of simultaneity and temporal order. As such this operation requires both the signals and the system, and so qualifies as mind-dependent.

13.   *Priest Revisited Again*

Whilst I have developed a cognitive account as an attempt to resist Priest's push for ontological inconsistency, I have yet to respond to his claim that time itself is inconsistent. As I briefly mentioned above, in his (2006) Priest applies the Spread Hypothesis to time, taking time to be a physical magnitude. I will develop his view here at greater length, but deny that this motivates a move beyond a cognitive account of inconsistent temporal experiences.

He starts with the Spread Hypothesis:

> A physical magnitude cannot be localised to its value at an
> instant of time, but only to those values it has at a small
> neighbourhood of that time.
>
> (Priest, 2006, p. 213)

We cannot pin down a state of affairs to a specific time. This is ontological. Priest thinks that the physical magnitude of the Spread Hypothesis could be matter, space, and even time. So at time noon, 'it is every time around 12 noon' (Priest, 2006, p. 215). He wants to apply this thought to the enigmas of time.

Suppose we take Priest's quote above and replace 'physical magnitude' with time. This gives us

> A [time] cannot be localised to its value at an instant of time,
> but only to those values it has at a small neighbourhood of
> that time.
>
> (Priest, 2006, p. 213)

So 12 noon cannot be localised to 12 noon, but only to the times around noon. Yet 12 noon has every time around 12. This means that every time around noon has the value 12 and 12 has the value of every time around noon.

First consider the flow of time. Priest first assumes that time is a physical magnitude. If we are to apply the Spread Hypothesis to time, time *has* to be physical in the same way that velocity and charge are physical magnitudes. It follows, Priest thinks, that the flow of time is explained by time being inconsistent. We do not have to invoke a hyper time, or take the flow to be cognitive.

> Thus, the reality of the flux of time does not have to be
> denied; neither does it have to be accommodated by the
> postulation of hyper-times. There is only one time, and that,
> being in a constantly inconsistent state, is in a state of flux.
>
> (Priest, 2006, p. 215)

He then turns to look at temporal direction, and thinks that time passes from the past into the future, because of the direction of change. Priest builds a skew into the Spread Hypothesis, such that the value at one end is lower than the value at the other; and this increase in value is the asymmetry of time. If the skews within a spread are aligned then this is sufficient to show that time has a direction. Priest then adopts the specious present, which he prefers to call the 'extended present' (Priest, 2006, p. 217). I only introduce this as groundwork for Priest's attempt to reject a charge of his theory being subject to a sorites problem.

The sorites charge is that applying the Spread Hypothesis to time entails that all times occur at 12 noon (a reintroduction of McTaggart's Paradox in another form,

I suggest). We cannot localise 12 noon except to a region around 12 noon. This also applies to 11.55am, for example. If we cannot localise 11.55 to 11.55 but only to a period surrounding it, then this period would, we think, intersect with the period around 12 noon. It follows that since all periods overlap, we could localise all times (through the intersection of their period) to the period around 12 noon. All times become 12 noon.

> [At] 12 noon it is every time in the interval around 12 noon
> [an interval being one minute]; thus it is also one minute to
> 12. But at one minute to 12 it is every time in the interval
> around one minute to 12. It is therefore two minutes to
> twelve.

<div align="right">(Priest, 2006, p. 218)</div>

Reapplying this logic entails that all times become 12 noon, both past and future. Priest here comes across McTaggart's Paradox.

He surveys four possible responses. First, instead of applying the conclusions of the Spread Hypothesis to time, we should end up applying them to the contents of time. Priest rejects this because we can no longer explain the flow of time in terms of the 'inconsistency of the state description of time' (Priest, 2006, p. 218). Second, we apply the Spread Hypothesis to time itself but reduce the interval to an infinitesimal. The sorites got started because Priest assumed the interval to be about one minute. Make that interval an infinitesimal then we have a quarantine for the sorites; 'adding an infinitesimal to an infinitesimal never gives a non-infinitesimal' (Priest, 2006, p. 218). This cannot explain the extended nature of the specious present, but Priest thinks that we might be expected to explain the extended present as a psychological phenomenon. Third, apply the Spread Hypothesis and a non-infinitesimal interval, but make a distinction between ''the time is t' being true and t being the index of the state description' (Priest, 2006, p. 219). Here when t is the index for 12 noon, it being 'one minute to 12' is true. But it does not follow, Priest thinks, that the index for 12 noon is at one minute to 12. Fourth, Priest takes time indexes to be vague, which means the charge is just a form of the sorites paradox. If so, then any of the supposed solutions to that paradox could be used.

None of these solutions are satisfactory. Priest rejects the first solution on the grounds that we could no longer use the inconsistent description of time to explain the flow of time. This is the 'vicious circle' argument of McTaggart's Paradox. We have to assume that time is inconsistent to explain that time is inconsistent. Priest wants to have the power of the inconsistent explanation, and on the basis of this desire, assumes that time has to be inconsistent. A desire for an inconsistent explanation is no *proof* that time is inconsistent. As such, I think Priest's first solution *does* work. It solves the problem by removing the inconsistency from time, something Priest does not want (so rejects). This solution does not work in the way that Priest wants it to.

Priest's second solution is to claim that the interval is infinitesimal, and that adding infinitesimals cannot entail the sorites. As a solution this may be preferable, if we wanted to explain time using inconsistency. Yet, we need some evidence that time is inconsistent. Priest thinks that an inconsistent approach is the best way to explain the flow of time. Yet we have no reason, beyond our experience, to think that time does flow. If so, then Priest's move here is blocked by my previous arguments about inconsistent images.

Third, Priest distinguishes between a temporal term, such as 'the time is T', being true, and a time T being an index for the truth-maker for the use of that term. He suspects that this introduces two dimensions of time. I suspect it does much more; it reintroduces the 'vicious series' version of McTaggart's Paradox. Suppose

that 'the time is T' is used to refer correctly to noon. We use the index Ti to assess the truth of this term, such that 'the time is T' is true at the time index (Ti) of 12 noon. Suppose that 'the time is T' is stated at one minute to noon; it is true at Ti that 'the time is T (noon)'. If time itself is inconsistent, what do we say abut Ti? We have to say that Ti itself cannot be localised to 12 noon, but only to a region around 12 noon. So to fix Ti we introduce Tii, or the index for our original time index, whereby we say that at Tii it is true that Ti applies. Here we have three dimensions of time; Tii, Ti, and the 'the time is T (noon)'. Again, if time is inconsistent, what do we say about Tii? We can only localise Tii to a region in time… and so on. We are entered on a vicious infinite regress. If so, then Priest has merely redescribed the 'vicious series' argument of McTaggart's Paradox. He needs to solve this before claiming it as a solution.

Priest is right that we could use any of the usual solutions to the sorites paradox to explain the problem. Yet unless we have reason to suppose that one of these solutions is *the* solution, merely pointing towards them is not convincing.

The failure to remove the charge of a sorites problem suggests that Priest's solution is still challenged by it. However, this just shows that Priest's theory is a sorites prone theory, as vulnerable to other sorites prone theories, such as theories about the moment when a foetus becomes conscious and so on. Being prone to the sorites problem is no reason to reject Priest's theory. However, the cognitive approach I have developed is not a sorites problem, or if it is, then it is a mind-dependent sorites, not a full blown ontology open to a sorites charge. Whilst time does appear to be inconsistent, and we *could* adopt Priest's account, I believe that the better option is to stay with the cognitive approach I have developed here. We have seen further evidence surveyed by Callender for the restriction of inconsistency to the mind/brain. If Callender is correct, and I suspect he is, we have strong evidence that the mind/brain plays a significant role in our experience of time. It is reasonable to suppose that the inconsistencies of our experience are also brought about by the mind/brain.

14.   Is There a Need for Paraconsistency?

I have rejected Priest's justification for ontological inconsistency. However, I believe that his account provides one of the best ways to deal with the impression of change. As such a rejection of Priest's ontology does not entail a rejection of paraconsistency. Rather, it might be required if we are to explain our experience of change. This applies to time since I have been arguing that we need an account for our non-verbal experiences of time *being* inconsistent.

Priest pushes for an intrinsic account of motion. What my arguments might do is restrict this intrinsic account to our experience of motion, and time itself. This seems to fit with the phenomenology. Our experience of a car in motion is of it being in two (incompatible) places at once, and at two (incompatible) times simultaneously. This is the one single impression. So motion in space and time is intrinsic to a single experience/impression.

I suggested that an A-theorist might be able to resurrect A-ish time if he adopted a paraconsistent approach. The argument would be that time is inconsistent, so the A Theory is required because it is the best description of inconsistent time. To date attempts have been made to make the A Theory consistent. The alternative is to accept the inconsistency of the A series and of A-ish time and invoke a paraconsistent A Theory to explain that.

However, I have shown here that this type of argument needs separate support. Just as our experience of time being A-ish is no proof that time itself *is* A-ish, our experience of inconsistency is no proof that the world, including time, is

inconsistent. Until we have some evidence to support the claim that it is, we ought to assume that time is consistent, since science, in the form of SR suggests that it is consistent.

We still require an explanation for the A-ish nature of our experience and the work here suggests that paraconsistency could provide that. I only offer it here as a tentative suggestion. Paraconsistency at this stage is required to deal with the inconsistent experiences we have: of time, motion, change and so on. As such we need paraconsistency, but the justification for this is epistemological, not Priest's ontological version.

15.   *Conclusion*

Chapter 17 pointed towards a paraconsistent picture of time. I have argued here that the inconsistency is in our *experience* of time. Like my treatment of Epistemic Time, the inconsistency is more than a property of thought alone, but not a full blown property of an objective reality. I have drawn the middle ground and argued that the inconsistency is involved in our experience, because our cognitive system may well be paraconsistent. The justification for paraconsistency is the epistemological justification. This allows for the paraconsistency to be A-ish enough to explain the presence of contradictions in our experience without committing us to following Priest's view that temporal reality itself is inconsistent.

Chapter 19
Conclusions

I set out to explain the differences between our experience of time and our understanding of time. Our experience of time is A-ish; events seem to pass from the future, to the present and into the past. Our rational understanding, as guided by science, seems to be B-ish. Yet the A and B series seemed incompatible. To see why I looked at McTaggart.

McTaggart claimed that if time is to be considered real, then our account of time has to give a good account of change. The change here is change of an event's *position in a time series*. Any other change is change *to* an event, and not the sort of change required to give an account of time. He thought the A series the *only* series that could give such an account. He then argued that the A series is inconsistent because no event could be past, present *and* future, yet it turns out that every event *is* past, present *and* future. Any attempt to remove such inconsistency, by saying that no event is past, present *and* future simultaneously either starts us on a vicious regress or is circular; this I called 'McTaggart's Paradox'. McTaggart concluded that if time required change and the only series that gave an account of change is the A series, then if it turned out that the A series were not real, then time would not be real.

Were we to reject McTaggart's reasoning and claim that the A series is the true account of time, then we would need to show that McTaggart's Paradox did not apply. Those who attempted this move I call A-theorists and I concluded that no such attempt has yet proved successful. Most attempts to remove McTaggart's Paradox invoked time to remove the regress; proponents unwittingly falling prey to the circular argument to resolve the regress argument.

Were we to accept McTaggart's reasoning, then the A series cannot be real and our experience of the reality of time would be an illusion. Were we to accept McTaggart's reasoning but deny his conclusion that time is unreal we would need to develop an account of time independent of the A series. We are motivated to do this because science, in the form of the Special Theory of Relativity (SR), ties time into the universe. I adopt SR as a guide to the physical state of the universe. Given SR, McTaggart's conclusion needs to be rejected. This means that our experience that time is real is not illusory.

SR also gives us a second argument against the A series (and consequently the A-theorist). According to SR the physical nature of space-time is symmetrical and there is no universe-wide privileged moment where existence is conferred upon events as they move from the future through that privileged (present) moment and into the past. As such, the A Theorist has two significant hurdles to cross: McTaggart and Einstein. I suggest all attempts to date fail.

We are motivated to accept the reality of time, but reject the claim that time is A-time. This leaves us with the B series, and the long neglected C series. B-theorists claim that the true time series is the B series; C-theorists would claim that the true time series is the C series. I rejected the B series as an account of time itself because it made assumptions not required by SR; the B series has an implied temporal direction whilst SR shows time to be symmetrical. I adopted the C series as an account of time because it did not assume this direction and gave us enough to 'do' science. The problem with these moves is that the B and C series are both significantly different to our experience of time. My task here was to reconcile our experience of time with our rational understanding of time.

To ensure clarity of conceptual understanding I distinguished between the experience of time, called Epistemic Time, and the ontology of time, called Ontic

Time. Ontic Time I characterised in terms of the C series. Epistemic Time was where the majority of the work had to be done. I suggested that were we to adopt a mind-dependency thesis, then we ought to give some account of what mind-dependency meant. I set out the mind-dependency of Epistemic Time in ways that would pay respect to our experience of time without making too much of that experience; i.e., an account that was A-ish but not *too* A-ish so as to attract McTaggart's Paradox or conflict with SR. I adopted an account of Epistemic Time analogous in many ways to secondary quality accounts of the perception of colour. Such a claim needed to be set out carefully, so an examination of Epistemic Time was required.

To undertake an examination of Epistemic Time I adopted phenomenology, specifically Husserl's interpretation, as a method of investigation. Through that phenomenology I identified several features of time: duration, succession, the Present Moment and flow. I examined each in turn and found that several of those features suggested that the mind/brain played a significant role in our experience. For example, two people can watch the same event and take it to pass slowly or quickly. This discrepancy could not be explained by reference solely to Ontic Time, and required the cooperation of the mind/brain, i.e. Epistemic Time.

From the phenomenology I concluded that we have reason to suppose that some aspects of duration and succession were features of Ontic Time, whilst some aspects ought to be attributed to Epistemic Time. The Present Moment, as indicated by the literature on time, is the central feature under dispute. SR suggests no such moment exists yet our experience seems restricted to such a moment. The specified nature of the phenomenology of that Present Moment gave no reason to suppose that there was an ontology underlying it. As such the Present Moment should be seen as a feature of Epistemic Time only. This leaves us with flow.

Central to the flow of time is an apparent direction. The status of temporal direction proved quite complex. We have reason to think that the direction of time is a mind-independent feature. The question is what that feature belongs to. The B-theorist attributed this feature to time itself, giving weight to his claim that the B series gives us an account of time. I rejected such a move. The direction of our experience only shows that there is temporal direction of things *in* time. Time itself remains symmetrical; it has no direction. It seems to be a mistake to confuse the direction *in* time to be the direction *of* time.

The phenomenology fleshed out the claims made about the mind-dependency of Epistemic Time in ways that gave weight to our experience of time without making contentious ontological claims. It seems then that our experience of time is derived through the interaction of the mind/brain and Ontic Time. This seems to mirror the B-theorist's rejection of the A Theory as merely mind-dependent. However, the mind-dependency here is cooperative, giving a role for the ontology, meaning that we cannot just dismiss the A Theory, rather we ought to give an account of it.

These moves were driven by an underlying assumption, inherited from McTaggart, but also prevalent in philosophy; that reality cannot be inconsistent. The existence of a contradiction is traditionally seen to be a problem for any account of reality; as exemplified by McTaggart's rejection of time based on the contradictions within the A series. The development of paraconsistent logic suggests that this underlying assumption of consistency is becoming less obviously sustainable. However, I believe, just like our experience of time is more than the existence of tensed language but less than a tensed ontology, that inconsistent experience is not proof of the existence of inconsistency.

This then, gives us an explanation for the difference between our A-ish

experience of time (which is, in McTaggart's terms, inconsistent) and our rational C-ish understanding of time, based on science. Our experience of time involves Epistemic Time which affects that experience much in the way that our perceptual system gives the impression that the world is coloured, when science suggests it is not (on the secondary quality account at least).

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