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Mind and Time: a local holism?

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Abstract

Let “Change” denote the movement in time of events from future to present to past. All versions of the A-theory of time consider Change (or a variation thereof) to be metaphysically real. Change being metaphysically real is, in terms of the A-theory, a primitive, mind-independent fact – something to be attributed just to the nature of time. But the B-theory of time considers Change to arise just with reference to an experiencing subject, being merely an apparent feature of an experiencing subject’s experience. In this thesis, I characterise this B-theoretic depiction of Change as Change obtaining relative to a “subjective temporal frame of reference”, this frame of reference being defined by the impermanent relations of futurity, presentness and pastness in which, in terms of the B-theory, events merely appear to stand to an experiencing subject.

There are a number of important arguments which tell against the A-theorist’s account of mind-independent, metaphysically real Change. Whilst these arguments might not be unanswerable, many philosophers find them weighty and they do, I believe, serve to consolidate the B-theoretic position that Change arises just with reference to an experiencing subject. But this need not, I propose, mean that the B-theorist is right to claim that Change is invariably mere appearance and, as such, invariably of no metaphysical significance. Rather, I claim that, with reference to certain philosophically respectable accounts of experiencing subjects, Change being metaphysically significant is an essential prerequisite of an experiencing subject’s perceptual experience as such experience is characterised by these accounts. Equivalently, this is to claim that, with reference to these accounts of experiencing subjects, the posited subjective temporal frame of reference, and the relations of futurity, presentness and pastness which define it, are to be accorded metaphysical significance. With reference to other philosophically respectable accounts of experiencing subjects, however, this is not the case since, I claim, Change being metaphysically significant is not an essential prerequisite of perceptual experience as it is characterised by these other accounts. This therefore suggests that there is a connection between the topic of the experiencing subject, and the topic of Change. More generally, it indicates that the metaphysics of mind, and the metaphysics of time, are correlated. Indeed, my principal claim in this thesis is that mind and time are inter-defined, forming a local holism.

Declaration of authorship

I confirm that the work presented in this thesis is my own.

Peter Jackson, November 2023

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Contents

| | |
|-------------------------------------------------------------------------------------|-----------|
| Abstract | i |
| Declaration of authorship | ii |
| Acknowledgements | iii |
| Contents | v |
| | |
| 1 Introduction and summary | 1 |
| 1.1 Selected aspects of the philosophy of time | 2 |
| 1.2 Frames of reference | 4 |
| 1.3 The proposed account in context | 4 |
| 1.4 Metaphysically significant Change and accounts of experiencing subjects | 6 |
| 1.5 Mind, and time, as a local holism | 7 |
| | |
| 2 The A-theory, the B-theory, and “Change” | 8 |
| 2.1 The A-series and the B-series | 8 |
| 2.2 Different versions of the A-theory | 10 |
| 2.3 The B-theory | 12 |
| 2.4 Different versions of the B-theory | 14 |
| 2.5 “Change” | 17 |
| 2.6 Concluding comments | 18 |
| | |
| 3 Philosophical arguments which deny the metaphysical significance of Change | 20 |
| Part 1 – J.M.E. McTaggart and the unreality of the A-determinations | 21 |
| 3.1 McTaggart’s Paradox | 21 |
| 3.2 McTaggart’s overarching ontological system | 22 |
| 3.3 A challenge to McTaggart’s argument for the unreality of the A-determinations | 24 |

| | | |
|----------|------------------------------------------------------------------------------------------------------|-----------|
| 3 | Philosophical arguments which deny the metaphysical significance of Change (<i>continued</i>) | |
| | Part 2 – Tensed sentences | 29 |
| 3.4 | Mellor's account of what makes tensed sentences true | 29 |
| | Part 3 – A note on presentism | 31 |
| 3.5 | Presentism and ersatzer presentism | 31 |
| | Part 4 – Concluding comments | 33 |
| 3.6 | McTaggart and a complete description of reality | 33 |
| 4 | Introducing frames of reference | 36 |
| 4.1 | The motion of objects in space | 37 |
| 4.2 | The movement of events in time | 38 |
| 4.3 | Concluding comments | 42 |
| 5 | Arguments concerning relativity theory | 46 |
| | Part 1 – Arguments from physics which deny the metaphysical significance of Change | 47 |
| 5.1 | The special theory of relativity | 47 |
| 5.2 | The special theory of relativity and time | 51 |
| | Part 2 – Arguments that relativity theory is consistent with A-theoretic Change | 54 |
| 5.3 | Is the A-theory compatible with the special theory of relativity? | 54 |
| 5.4 | Attempts to conform the A-theory with the special theory of relativity | 55 |
| 5.5 | The general theory of relativity | 61 |
| | Part 3 – Why relativity theory need not rule out metaphysically significant Change | 65 |
| 5.6 | The construction of Einsteinian spacetime | 65 |
| 5.7 | The intrinsic metrical amorphousness of continuous spacetime | 67 |
| 5.8 | Measuring rods, clocks, and a physical interpretation of coordinate systems | 70 |
| 5.9 | Empty space? | 75 |
| 5.10 | Concluding comments | 80 |

| | | |
|----------|-------------------------------------------------------------------------------------------------|------------|
| 6 | Gareth Evans on egocentric and objective space | 85 |
| 6.1 | What Gareth Evans tells us about space... | 86 |
| 6.2 | ... and what he could have told us about time | 90 |
| 6.3 | The dimensions of the subjective temporal frame of reference | 93 |
| 6.4 | Concluding comments | 95 |
| 7 | Theories of perceptual experience and the subjective temporal frame of reference | 98 |
| | Introductory remarks including a summary of the main claims and proposals of the thesis to date | 98 |
| | Part 1 – Theories of perceptual experience | 100 |
| 7.1 | Direct realism and representationalism | 100 |
| 7.2 | Hallucinations, illusions, and disjunctivism | 103 |
| 7.2.1 | Introduction to hallucinations and illusions | 103 |
| 7.2.2 | Introduction to disjunctivism | 104 |
| 7.2.3 | Defending disjunctivism | 106 |
| 7.3 | Conclusion to Part 1 | 110 |
| | Part 2 – Perceptual experience and our contact with time | 110 |
| 7.4 | Perceptual experience and Change | 110 |
| 7.5 | Change as an essential prerequisite of direct realism | 116 |
| | Part 3 – Direct realism and a world which is objectively B-theoretic | 120 |
| 7.6 | Direct realism and the subjective temporal frame of reference | 120 |
| | Part 4 – Conclusion to chapter 7 | 124 |
| 7.7 | Concluding comments | 124 |
| 8 | Accounts of persons and the subjective temporal frame of reference | 125 |
| | Part 1 – Accounts of persons which do not entail metaphysically significant Change | 126 |
| 8.1 | Introduction to Part 1 | 126 |
| 8.2 | Functionalism | 126 |
| 8.3 | David Hume's account of personal identity | 128 |
| | Part 2 – Accounts of persons which do entail metaphysically significant Change | 133 |
| 8.4 | Introduction to Part 2 | 133 |
| 8.5 | Accounts of persons as embodied consciousnesses | 134 |

| | | |
|----------|-------------------------------------------------------------------------------------------------------|------------|
| 8 | Accounts of persons and the subjective temporal frame of reference (continued) | |
| 8.6 | Change as an essential prerequisite of accounts of persons as embodied consciousnesses | 139 |
| | Part 3 – Accounts of persons as embodied consciousnesses and a world which is objectively B-theoretic | 144 |
| 8.7 | Accounts of person as embodied consciousnesses and the subjective temporal frame of reference | 144 |
| | Part 4 – The nature of the experiencing subject | 148 |
| 8.8 | The experiencing subject <i>qua</i> experiencing subject | 148 |
| | Part 5 – Conclusion to chapter 8 | 153 |
| 8.9 | Concluding comments | 153 |
| 9 | Conclusions of the thesis | 154 |
| | Bibliography | 156 |

1

Introduction and summary

That events move, or change their position, in time, from their being future, to their being present, to their being ever-increasingly past, is a natural, and seemingly veridical, feature of our everyday experience. I refer to this movement in time of events from future to present to past as “Change” (with a capital “C”). According to some philosophical accounts of time, our experience of Change is, indeed, veridical, Change being a mind-independent, metaphysically real feature of the world. According to other accounts, however, Change arises just with reference to an experiencing subject, being merely an apparent feature of an experiencing subject’s experience. I characterise this notion of Change arising just with reference to an experiencing subject as Change obtaining relative to a “subjective temporal frame of reference”, such frame of reference being defined by the impermanent relations of futurity, presentness and pastness in which events stand to an experiencing subject.

In this thesis, I suggest that certain important arguments which tell against the notion of mind-independent Change are persuasive. As such, I agree with those who claim that Change is something which arises just with reference to an experiencing subject. But I do not thereby propose that Change is invariably mere appearance and, as such, invariably of no metaphysical significance. Rather, I claim that the question of the metaphysical significance of Change is best considered alongside a consideration of the nature of the experiencing subject. And, I claim, with reference to certain philosophically respectable accounts of the experiencing subject, the Change which obtains relative to the subjective temporal frame of reference is to be accorded metaphysical significance. With reference to other philosophically respectable accounts of the experiencing subject, however, Change is not to be accorded metaphysical significance. This therefore suggests that there is a connection between the topic of the experiencing subject, and the topic of Change. More generally, it indicates that the metaphysics of mind, and the metaphysics of time, are correlated. Indeed, my principal claim in this thesis is that mind and time are inter-defined, forming a local holism. In this chapter, I provide an outline of how an argument to this effect is constructed over the course of the chapters which follow.

1.1 Selected aspects of the philosophy of time

Let “Change” (with a capital “C”) denote the movement in time of events from future to present to past. All of the versions of the theory of time known as the A-theory, as is discussed in chapter 2 of this thesis, present Change (or a variation thereof) as something that is mind-independently metaphysically real – something that is objective, and absolute. However, there are important philosophical arguments to the contrary – arguments which tell against the metaphysical reality of futurity, presentness and pastness on which objective, absolute Change would depend. (I will sometimes refer to futurity, presentness, and pastness, collectively, as the “A-determinations”.) The most famous philosophical argument to this effect is known as “McTaggart’s Paradox”. Briefly put, J.M.E. McTaggart, as does the A-theorist, considers that time essentially involves Change. But Change, McTaggart claims, involves a contradiction. This is because, as has been said, Change involves events being future, being present, and being past. But these, McTaggart contends, are incompatible ways of being, meaning that no event can really be future, present, and past. Hence, the A-determinations of futurity, presentness and pastness cannot be metaphysically real features of the universe – and nor, therefore, can Change (McTaggart, 1927: §306, §329, §333). This initial characterisation of McTaggart’s argument is expanded upon in chapter 3, where a possible counterargument to it is also considered. Since, or so I argue, the counterargument is unsuccessful, I claim that McTaggart’s argument against objective, absolute Change is persuasive, a claim which is further supported by an analysis of Hugh Mellor’s account of the truthmakers of tensed sentences. The chapter ends by suggesting that, whilst Change as it is construed by the version of the A-theory known as *presentism* can be thought to avoid McTaggart’s argument, presentism arguably faces difficulties with regard to other considerations.

The notion of objective, absolute Change is also brought into question by certain arguments which emanate from the world of physics – in particular, from Albert Einstein’s relativity theory. This is because, as is discussed in chapter 5, Einstein, like McTaggart and Mellor, concludes that the A-determinations, and Change, are not metaphysically real features of the universe. As Einstein puts it:

“People... who believe in physics, know that the distinction between past, present and future is only a stubbornly persistent illusion” (Einstein, 1955: §215).

This conclusion follows from Einstein’s determining that simultaneity is not an absolute consideration – there is, this is to say, no real relation of absolute simultaneity at a distance.

Rather, simultaneity is a relative consideration which can only be weighed relative to a particular inertial system of coordinates. And, whilst two spatially separate events might be simultaneous in one system of coordinates, in another, they might not be (Einstein and Infeld, 1938: 178-179, 185, 207-208). It then follows that there is no real A-determination of absolute presentness since, if there were, then whichever events exhibited it would be absolutely simultaneous with one another. This lack of absolute, or objective, presentness then rules out any notion of events changing from being future, to being present, to being past, in any definitive fashion. On this basis, any notion of objective, absolute Change, as it is presented in the A-theory, is denied. Certain arguments which seek to relativise objective Change within A-theoretic parameters are also considered in chapter 5 and are, I claim, unsuccessful. Overall, therefore, as was the case with McTaggart, and with Mellor, the arguments which Einstein makes in opposition to the notion of A-theoretic Change are considered to be persuasive.

In denying the notion of objective, absolute Change, McTaggart, Mellor, and Einstein are all suggesting that our seeming experience of events changing from being future, to being present, to being ever-increasingly past, is mere appearance – merely a psychological feature of our lived experience, or what Einstein has been seen above to call a “*stubbornly persistent illusion*” (Einstein, 1955: §215). (Mellor’s particular interpretation of this is further described in chapter 4.) A difference between Einstein and Mellor, on the one hand, and McTaggart on the other, however, is that, whilst they all deny the notion of objective, absolute Change, Einstein and Mellor do not join McTaggart in taking this to amount to the denial of the reality of time itself. This is because Einstein and Mellor do not join McTaggart in the contention that time essentially involves objective, absolute Change such that, if objective, absolute Change is ruled out, then the metaphysical reality of time is ruled out, too. Rather, Mellor advocates what is probably the most widely endorsed contemporary philosophical theory of time, namely, the B-theory, a position with which Einstein’s account is also consistent.

According to the B-theory, then, the A-determinations of futurity, presentness and pastness, and objective, absolute Change, are not metaphysically real features of the universe. However, as is shown in chapter 2, what the B-theorist then claims is that time is constituted, not in terms of the A-determinations as McTaggart would have it, but by the temporal relations in which events stand to one another. These relations are the so-called “B-relations” of earlier-than and later-than. The B-relations of earlier-than and later-than are permanent, unchanging relations. For example, if an event is ever earlier than another event, then it is earlier than it for all eternity. As such, the B-relations do not cultivate any notion of Change. But, claims the B-theorist, they do, nevertheless, provide all that is needed for a metaphysically robust

account of the nature of time. And, given the persuasive nature of the arguments against the A-theoretic notion of objective, absolute Change brought by McTaggart and Mellor, and also contained within relativity theory, it is suggested in chapters 3 and 5 that it is the B-theory which provides the more persuasive account of the objective nature of time. Accordingly, it is proposed in those chapters that the world, in not containing mind-independent, objective, absolute Change, is a world which is, in this sense, objectively B-theoretic.

1.2 Frames of reference

However, in proposing that the world, in not containing mind-independent, objective, absolute Change, is, in this sense, objectively B-theoretic, this is not to say that I am following the B-theorist in considering that Change is invariably mere appearance. I will, in this thesis, be making much use of the notion of frames of reference. In this regard, the B-theory will be said, at a metaphysical level, to be essentially deploying what I will call the *objective temporal frame of reference*, such frame of reference being defined by the permanent temporal relations in which events stand to one another – i.e., by the B-relations of earlier-than and later-than. Relative to this objective temporal frame of reference, consistently with the B-theory, Change does not obtain. What I will be suggesting, however, is that the objective temporal frame of reference is not the only frame of reference which is relevant to considerations of Change. In particular, in chapters 4 and 6 I will suggest that consideration is also due of a *subjective temporal frame of reference*. This subjective temporal frame of reference is defined by the relations of futurity, presentness, and pastness in which events stand to an experiencing subject. More particularly, events stand in these relations to the temporal location of an experiencing subject's point of view, situated at their subjective "*now*" – this subjective "*now*" constituting the point of origin of the subjective temporal frame of reference. And, given the impermanent nature of these relations, relative to this subjective temporal frame of reference, Change *does* obtain.

1.3 The proposed account in context

Now, to this point, whilst I have said that I am not following the B-theorist in considering that Change is invariably mere appearance, it might be thought that there is nothing in the description of temporal frames of reference in section 1.2 to which the B-theorist need object. Indeed, the B-theorist, though denying the metaphysical significance of Change, can reasonably be characterised, I suggest, as deploying, not only the objective temporal frame of

reference, but the subjective temporal frame of reference, too. Their point would simply be that, of these two temporal frames of reference, only the objective one is to be accorded any sort of metaphysical standing. The subjective temporal frame of reference, in contrast, would be being deployed just as a device by which to illuminate the notion that Change is an apparent feature of an experiencing subject's experience – a notion to which the B-theorist, in any case, subscribes.

My claim, however, will be that the subjective temporal frame of reference, and the Change which obtains relative to it, are, after all, to be accorded metaphysical standing – but only in certain circumstances. This is because, I will claim, the question of the metaphysical significance of the subjective temporal frame of reference, and of the Change which obtains relative to it, is best considered alongside a consideration of the nature of the experiencing subject whose subjective “now” has been said in section 1.2 to constitute the point of origin of the subjective temporal frame of reference. And what I will claim is that, with reference to certain accounts of experiencing subjects, the subjective temporal frame of reference, and the Change which obtains relative to it, are, indeed, to be accorded metaphysical significance. With reference to other accounts of experiencing subjects, however, they are not. That this is the case is because, with reference to certain accounts of experiencing subjects, metaphysically significant Change is *an essential prerequisite of perceptual experience as it is characterised by those accounts* whilst, with reference to other accounts, it is not. This claim might be summarised, and contrasted with the A-theory and the B-theory, as follows:

- The A-theory considers Change to be mind-independently metaphysically real, and attributes this just to the nature of time. Any consideration of the experiencing subject is orthogonal to the notion of Change.
- The B-theory denies the notion of mind-independent Change, instead considering Change to obtain relative to a subjective temporal frame of reference, and to invariably be mere appearance. The non-existence of metaphysically significant Change is due to the nature of time, and is independent of any consideration of the nature of the experiencing subject occupying the subjective temporal frame of reference.
- The proposed account joins the B-theorist in denying the notion of mind-independent Change and in considering Change to obtain relative to a subjective temporal frame of reference. However, the proposed account then claims that the question of whether Change is metaphysically significant must take into account the nature, not only of time but, also, of the experiencing subject. With reference to certain accounts of experiencing subjects, the Change obtaining relative to the subjective temporal frame

of reference is mere appearance, as the B-theorist claims. But, with reference to other accounts of experiencing subjects, such Change is metaphysically significant.

1.4 Metaphysically significant Change and accounts of experiencing subjects

The claim that the subjective temporal frame of reference, and the Change which obtains relative to it, are metaphysically significant with reference to some, though not all, accounts of experiencing subjects is explored in chapters 7 and 8. Chapter 7 comprises an examination of certain philosophically respectable accounts of conscious perceptual experience – namely representationalism, and direct realism. Metaphysically significant Change, I claim, is not an essential prerequisite of representationalism – but it is an essential prerequisite of direct realism. I then argue that, as it is standardly presented, direct realism is taking the world to be a world which is objectively A-theoretic – a world, that is, which exhibits mind-independent, objective, absolute Change. But it is suggested in chapter 7 that direct realism can, in fact, be repositioned within a world which is, as I have proposed it to be in chapters 3 and 5, objectively B-theoretic in the sense of its not containing mind-independent, objective, absolute Change. In effecting this repositioning into a B-theoretic world, I suggest that a certain structural feature of the distinctive conscious perceptual relation in terms of which direct realism is defined – such structural feature being that which imparts to conscious perceptual experience the metaphysically significant Change which, I have argued, is essential to such experience – presupposes the metaphysical significance of the subjective temporal frame of reference. Hence, in a world which is objectively B-theoretic, the subjective temporal frame of reference, and the Change which obtains relative to it, are, with reference to direct realism, metaphysically significant. With reference to representationalism, however, they are not.

In chapter 8, which is, in effect, a companion chapter to chapter 7, certain philosophically respectable accounts of persons are examined with a view to determining whether or not such accounts essentially involve metaphysically significant Change. I claim that functionalism, and the account of personal identity provided by David Hume (1739/ 1740), do not essentially involve metaphysically significant Change. However, it is proposed that metaphysically significant Change is an essential prerequisite of what I call *accounts of persons as embodied consciousnesses*. Equivalently to what is said in chapter 7 with regard to direct realism, I argue in chapter 8 that accounts of persons as embodied consciousnesses, as they are standardly presented, presuppose a world which is objectively A-theoretic. However, it is suggested in chapter 8 that accounts of persons as embodied consciousnesses can be repositioned within a world which is, as I claim it to be, objectively B-theoretic. In effecting this

repositioning, I claim that the metaphysically significant Change which is an essential prerequisite of such accounts is secured via an appeal to the metaphysical significance of the subjective temporal frame of reference. In part, this claim is made via the epistemological argument that, on the assumption that the world is objectively B-theoretic, the knowledge of the mind-independent external world to which accounts of persons as embodied consciousnesses appeal presupposes the metaphysical significance of the subjective temporal frame of reference – an argument which, appropriately modified, is said also to apply in the case of direct realism. Hence, in a world which is objectively B-theoretic, the subjective temporal frame of reference, and the Change which obtains relative to it, are, with reference to accounts of persons as embodied consciousnesses, metaphysically significant. With reference to functionalism, however, or with reference to the Humean person, they are not.

1.5 Mind, and time, as a local holism

It is argued in chapters 7 and 8, then, that the subjective temporal frame of reference, and the Change which obtains relative to it, are metaphysically significant with reference to some, though not all, accounts of experiencing subjects. If this is correct, it can be seen to point to there being a connection between the topic of the experiencing subject, and the topic of Change. This indicates more broadly that the metaphysics of mind, and the metaphysics of time, are correlated. Indeed, the principal claim to be defended in this thesis is that mind and time are inter-defined, forming a local holism.

2

The A-theory, the B-theory, and “Change”

Problematic aspects of the temporality of the world have been among the concerns of philosophers since at least the days of Heraclitus and Parmenides (Waterfield, 2000: 32-68). This chapter introduces certain of these problematic aspects as they are currently characterised. Rather than providing a comprehensive analysis of all of these aspects, the discussion is, in general, limited to matters which are of relevance to the thesis as a whole. In sections 2.1 to 2.4, the two principal contemporary realist theories of time, namely, the A-theory and the B-theory, are described, including making reference to certain variants of these two theories. Section 2.5 then highlights a notion which is central to this thesis, namely, the notion of events moving, or changing their position, in time, from their being future, to their being present, to their being ever-increasingly past. I refer to this movement in time of events from future to present to past as “Change” (with a capital “C”). It is then suggested that Change which is mind-independent, and metaphysically real, is a feature of A-theoretic accounts of time, but not of B-theoretic accounts of time. In section 2.6, the thought is introduced that, whilst the A-theory seemingly has greater intuitive appeal than the B-theory, there are, nevertheless, important arguments which tell against the A-theory’s positing of mind-independent, metaphysically real Change .

2.1 The A-series and the B-series

As J.M.E. McTaggart tells us, the ordering of events in time, and the ordering of moments of time, can be depicted in two ways. One way is to characterise the events, and the moments of time, as being future, or present, or past. The other way is to characterise them as being earlier than, or later than, one another. The first sequence of events and moments, McTaggart calls the “A-series”; the second, he calls the “B-series” (McTaggart, 1908: 458). In line with this distinction, I will, in this thesis, sometimes refer to futurity, presentness and pastness

collectively as the “A-determinations”. The relations of “earlier-than”, and “later-than”, I will sometimes refer to as the “B-relations”.¹

It is relevant to note that there is an important structural difference between the A-series and the B-series. In terms of the A-series, every event, and every moment of time, changes with regard to the position which it occupies. This is to say, every event, and every moment of time, changes with regard to whether it is future, or present, or past, and, indeed, with regard to the degrees to which it is future or past. But the relations of earlier-than and later-than in which events, and moments of time, stand to one another in the B-series are permanent relations: if one event (e_1) is ever earlier than another event (e_2), and e_2 (correspondingly) is ever later than e_1 , then e_1 and e_2 will stand in these relations to each other for all eternity (McTaggart, 1908: 458).

Whilst they are importantly different in this way, however, the A-series and the B-series are not completely independent. As McTaggart puts it:

“The term P is earlier than the term Q if it is ever past while Q is present, or present while Q is future” (McTaggart, 1927: §610).

But this seemingly harmonious inter-relationship between the A-determinations of futurity, presentness and pastness, and the earlier-than/ later-than B-relations, does not mean that philosophers of time will naturally accord equal ontological standing to both. Indeed, it can be detected in McTaggart’s phraseology that he is, in fact, treating the A-series as more fundamental than the B-series. This is because, on McTaggart’s account, as will be expanded upon in sections 3.1 to 3.3, the very existence of time requires an A-series. The B-relations, this is to say, can only come to be if the existence of time is secured by an A-series – the B-relations essentially being, on McTaggart’s account, relations *within* time (McTaggart, 1908: 461-464; McTaggart, 1927: §312). McTaggart’s thinking in this regard is very much aligned with those philosophers who, in today’s terminology, are known as “A-theorists” of time.

This is not to say, however, that all contemporary philosophers of time agree with McTaggart in this regard. There are, this is to say, philosophers who claim that the existence of time does not, in fact, require an A-series in the way which McTaggart contends. Rather, time can, after all, be constituted just by the B-relations. And, continues the claim made by these so-called

¹ Strictly, McTaggart does not hyphenate the terms “A-series” and “B-series”, though it is now conventional to do so.

“B-theorists” of time, the A-determinations which underscore the A-series form no part of metaphysical reality. It can be seen, therefore, that privileging one series rather than the other can lead to very different metaphysical views about the nature of time. In contemporary philosophy, it is the “A-theory”, and the “B-theory”, which comprise the two principal realist theories of time.²

2.2 Different versions of the A-theory

As I have suggested in section 2.1, for the A-theorist, the A-determinations of futurity, presentness and pastness are indispensable ingredients in any proper understanding of what time is. One consequence of this is that there is, according to the A-theorist, a single moment of time which is, in a primitive and objective sense, *present* – though, since moments of time constantly change their positions in the A-series, which moment it is that is present is constantly changing (just as which *events* are present is constantly changing). Accordingly, the A-theory can be said to be positing what we might call a *moving present*.

So far, this might all seem fairly uncontroversial. We do, after all, at any time, seem to inhabit, and to directly experience states of affairs at, just a single, present moment of time – a moment which, while it lasts, is in some sense special compared with other times. Furthermore, as the moment which is fleetingly special is replaced by another fleetingly special moment which was previously a future moment, and that moment is then replaced by other such moments, we do feel caught up in these changes, trapped in their thrall. And, in being so trapped, we have a sense that the arrival of those events which are, ephemerally, the freshly-minted present ones somehow serves to propel the previously-present events into an ever more distant past. Indeed, one of the virtues of the A-theory – and one of the principal motivations for it – is that it does seem to accurately capture how it is that we take the world, and our experience of it, to be, a virtue of the A-theory with which, as will be seen in sections 2.3 to 2.5, the B-theory cannot hope to compete.

² It should be noted that McTaggart was not himself an A-theorist, nor a B-theorist. Like the B-theorist, he denied the metaphysical reality of the A-determinations and, therefore, of the A-series. However, since, in contrast to the B-theorist, for McTaggart, the very existence of time would require an A-series, McTaggart concluded that time is unreal (McTaggart, 1927: §312, §§329-333). McTaggart’s arguments are further discussed in sections 3.1 to 3.3, 3.5 and 3.6.

That said, however, at least a degree of reining in is required. This is because, whilst the A-theory can, indeed, boast certain intuitive credentials, the various guises under which it is fleshed out can seem to put these credentials under somewhat of a strain. The principal difference between the various guises of the A-theory concerns just what it is that is to be regarded as *real* – what it is that is to be regarded as constituting a part of *reality*. At one end of the A-theoretic spectrum in this regard are the so-called Moving Spotlight A-theorists, for whom all events in time, and all moments of time, are regarded as real – whether, this is to say, such events, or moments, are future, or present, or past. In other words, whatever their position in the A-series might be, events and moments are to be accorded the status of being real. The “moving spotlight” allusion is then to be thought of in terms of there being a narrow (in principle, a width-less) beam of light sweeping steadfastly along the series of events and moments so as to pick out those events and moments which are, evanescently, to be deemed *present* events and moments. This can be seen to vividly capture the A-theoretic idea of the moving present. But it also commits the Moving Spotlight A-theorist to regarding those events and times which are fleetingly illuminated by the beam as having, at that instant, something over and above all the other events and moments – as being, in some sense, *more real* than all the other events and moments. What the Moving Spotlight A-theorist means by “more” (or “maximally”, or “fully”) real can seem obscure. Generally, however, it does at least seem to mean that conscious experience is confined just to the present. Hence, whilst Socrates’ existence, in terms of the Moving Spotlight A-theory, is generally to be accorded an equality of reality with that of someone living today, it would seem that the mode of existence enjoyed by subjects, such as Socrates, who inhabit the past, or, indeed, by subjects who inhabit the future, does not also permit them to be conscious, or to enjoy conscious experience (Dainton, 2011: 405-406; Prosser, 2016: 3-5).

A second variant of the A-theory is the so-called Growing Block A-theory. A-theorists of a growing block persuasion differ most starkly from Moving Spotlight A-theorists in denying the reality of the future. Rather, reality, they contend, consists just of the present and the past. The “growing block” is then to be imagined as a four-dimensional slab which constantly grows as new slices of reality (to be regarded, flickeringly, as *present* slices of reality) come into objective being. Hence, what constitutes the *present* for the Growing Block A-theorist is the “leading edge” of the block, this leading edge continuously comprising new events and times which come into existence as the leading edge ploughs ever onwards as the block grows. On a standard reading of the Growing Block A-theory, both the present and the past (i.e., all of reality as here construed) are to be accorded full, or maximal, reality. A twist on the theory, however, namely, the Growing Block/ Glowing Edge A-theory, does restore the idea from the Moving Spotlight A-theory that the present is *more real* than are other existent times.

According to the Growing Block/ Glowing Edge A-theory, this is to say, it is only the leading (and, now, “glowing”) edge of the block that is maximally real. As with the Moving Spotlight A-theory, conscious experience is restricted to this maximally real present (Dainton, 2011: 405-406; Prosser, 2016: 5-6).

Finally, whilst it is sometimes regarded as a separate theory, I will, for the purposes of this thesis, include, as a further variant of the A-theory, the position known as presentism. The presentist has an even more restricted view of reality than does the Growing Block A-theorist. It might be put that, whilst, for the Growing Block/ Glowing Edge A-theorist, and, indeed, for the Moving Spotlight A-theorist, there is no time like the present, for the presentist, there is no time *but* the present. According to the presentist, this is to say, past and future events and times simply do not exist, the entirety of reality consisting in what is transiently present. The A-theoretic idea of the moving present thus comes to be couched just in terms of one transient present being continuously replaced by another one, rather than in terms which also involve futurity and/ or pastness. In one sense, then, the presentist is proffering a present akin to the Growing Block A-theorist's leading edge. But, for the presentist, the leading edge is what constitutes the whole of reality since, unlike the Growing Block A-theorist, the presentist consigns all that was once present to the terminal darkness of an unreal past (Dainton, 2011: 406).

2.3 The B-theory

As noted in section 2.1, the principal rival to the A-theory in terms of realist accounts of time is the B-theory. In one sense, the B-theory is like the Moving Spotlight A-theory. This is because the B-theorist regards as real the very same events, and moments of time, as does the Moving Spotlight A-theorist – i.e., all those events and times which the Moving Spotlight A-theorist categorises as either future, or present, or past. But, as we have seen in section 2.1, the B-theorist does not agree with McTaggart's claim that the A-determinations are essential to the existence of time. Rather, the B-theorist's claim is that time can be constituted just by the B-relations of earlier-than and later-than in which events, and moments of time, stand to one another. Indeed, the B-theorist denies that the A-determinations are metaphysically real features of the universe at all. In consequence, whilst the B-theorist agrees with the Moving Spotlight A-theorist over which events, and which moments of time, are real, the B-theorist has no truck with the Moving Spotlight A-theorist's categorisation of these events and moments as, variously, future, or present, or past. More fully put, then, the

B-theory is like the Moving Spotlight A-theory – but a Moving Spotlight A-theory without a spotlight.

Lacking a spotlight, the B-theorist avoids the difficulty faced by the Moving Spotlight A-theorist in seeking to account for just what it is that the spotlight is bestowing upon those (present) events and times which are said to be fleetingly raised to a level of maximal reality. For the B-theorist, this is to say, all events and times, however they might be categorised by the Moving Spotlight A-theorist, can be deemed equally, and maximally, real. But this move is not without consequence. The moving spotlight, as we saw in section 2.2, brings with it the intuitive idea of a moving present. Lacking a spotlight, the B-theorist has no such moving present. In fact, in denying the metaphysical reality of the A-determinations, the B-theorist has no present of any sort – nor, indeed, any past, nor any future. Rather, recall that the B-relations of earlier-than and later-than are relations in which events, and moments of time, stand to one another for all eternity. What this means is that the B-theorist is claiming that all events, and all moments of time, whilst we might colloquially think of them as “future”, or “present” or “past”, in fact, *coexist* on an equal ontological basis – and do so eternally. They exist, this is to say, tenselessly, in a permanent, unchanging order, “*e exists at t* ” entailing “*e exists, simpliciter*”. As such, all events, and all times, are (tenselessly) equally real, and maximally so. They differ, not in their ontological status, but only in respect of their temporal locations within the world (Dainton, 2010: 7-10).

It is worthwhile pausing here to see just what it is that is being claimed by the B-theorist. The basic idea is that, whilst we might all be accustomed to thinking of events and moments of time as either future or present or past, these distinctions, according to the B-theorist, do not reflect how the world really is. Rather, events and moments, however we might categorise them, are metaphysically all of a piece – all of them enjoying, alongside one another, an eternal, tenseless existence of equal ontological standing. As such, it is clear that the B-theoretic world is very different from the world as we encounter it. Indeed, perhaps the only (non-alien) person who did come to encounter the world as a B-theoretic world is Billy Pilgrim, a character in Kurt Vonnegut’s novel *Slaughterhouse-Five*. As Billy learned from the Tralfamadorians (residents of the alien planet Tralfamadore):

“... when a person dies he only *appears* to die. He is still very much alive in the past...³
All moments, past, present, and future, always have existed, always will exist. The Tralfamadorians can look at all the different moments just the way we can look at a

³ This can be seen to accord with Albert Einstein’s remark regarding Michele Besso in section 5.2.

stretch of the Rocky Mountains, for instance. They can see how permanent all the moments are, and they can look at any moment that interests them. It is just an illusion... that one moment follows another one... and that once a moment is gone it is gone forever" (Vonnegut, 1969: 22).

Whilst some of the language employed here could be more rigorously tenseless, this does, I think, vividly portray the counterintuitive B-theoretic world in which all events and moments eternally coexist. No events or moments, it might be put, are, metaphysically speaking, "special" in such a way as to be designated as "present" and, concomitantly, no events or moments are such as to be designated "past" or "future". And, whilst the characterisation of the world provided by the B-theorist is, indeed, counterintuitive, it does, as will be expanded upon in chapter 5, find support from the physical sciences. As Albert Einstein proposes in the context of the special theory of relativity: "It appears more natural to think of physical reality as a four-dimensional existence, instead of, as hitherto, the *evolution* of a three-dimensional existence" (Einstein, 1916: 152). Einstein is here referring to the transformation of classical physics (the evolving three-dimensional account) into relativistic physics (the static four-dimensional account), but his point can be seen to be very much echoed in the A-theory *versus* B-theory debate.

2.4 Different versions of the B-theory

As was seen to be the case with the A-theory in section 2.2, the B-theory also comes in various different versions. One difference arising among B-theorists concerns the directionality of time. B-theorists all agree that time has a direction – the various earlier-than/ later-than relations aligning and corresponding in such a way that time does consistently point just one way. But differences arise over the ontological status to be accorded to this directionality. More specifically, the question that arises concerns whether it can rightly be said that the earlier-than/ later-than relations which constitute (B-theoretic) time are, themselves, fundamental temporal relations. If so, then time is, in and of itself, inherently directional. But, alternatively, is it the case that the notions of earlier and later are reducible to some other asymmetry obtaining in the world? If so, then it would be this other asymmetry playing out within time which gives time its seeming directionality, rather than time itself being inherently directional.

In general, B-theoretic thinking seems to favour this latter view, i.e., the view that time is not, in and of itself, inherently directional but, rather, that temporal directionality is reducible to

some other asymmetry. A prime contender for the other asymmetry in question is then often taken to be *causation* – causation being asymmetric in the sense that causes precede their effects, and seem to do so as a matter of mind-independent, irreducible fact.⁴ This causal precedence, it can then be claimed, is essentially (and exclusively) temporal precedence since, as Hugh Mellor puts it “... *time is the only dimension in which causes are always separated from – by being earlier than – their effects*”, such that “... *time can be defined as the causal dimension of spacetime*” (Mellor, 1998: 84). Accordingly, it is “... *causation [that fixes] the time order of any two spacetime points*” (Mellor, 1998: 113). Temporal order, this is to say, is reducible to causal order (Mellor, 1998: 111).⁵

However, whilst it does seem to be the prevailing view among B-theorists that a derivative account of temporal directionality, such as that provided by Mellor, is required, this view is not universally held. Certain B-theorists, this is to say, find derivative accounts unnecessary since, they claim, the B-relations are, after all, fundamental temporal relations, such that time is inherently directional. One proponent of this view is Nathan Oaklander, who also finds this idea within the pioneering B-theoretic account provided by Bertrand Russell (Oaklander, 1984: 143; Oaklander, 2012: 4-5, 14; Russell, 1903: 95-96; Russell, 1915(a): 228-229; Russell, 1915(b): 401-403). Indeed, regardless of its claims concerning directionality, Russell’s account would in any case represent a distinct variant of the B-theory in virtue of its treatment of tensed sentences – tensed sentences being sentences, such as “e is past”, “e is present”, etc., which include A-determinations or conversationally equivalent terms.

Tensed sentences such as “e is past” are, it would generally be agreed, in common everyday usage. In consequence of this, they also feature prominently in the A-theory *versus* B-theory debate, since it might be suggested that our habitual recourse to them is reflective of an underlying metaphysical reality as regards the A-determinations to which such sentences appeal – a metaphysical reality which B-theorists, such as Russell, wish to deny. In the case

⁴ Strictly, making this statement requires that simultaneous causation be first ruled out. Persuasive arguments against the notion of simultaneous causation have been proposed by, for example, Robin Le Poidevin (Le Poidevin, 1991: 83, 86-92).

⁵ Mellor briefly considers – and rejects – other asymmetries to which temporal asymmetry might be thought to be reducible, including the tendency of low entropy states to precede states of higher entropy. This, as Mellor notes, would not explain our ability to perceive temporal direction, and nor does it explain causal asymmetry (Mellor, 1998: 119). Furthermore, theoretical physicist Carlo Rovelli denies that increasing entropy is, in any case, a real feature of the universe, its being, instead, a perspectival aspect of our experience deriving from our restricted access to the universe (Rovelli, 2017: 23-33).

of Russell, the denial of the metaphysical reality of the A-determinations centres on the claim that, whilst we do indeed make frequent use of tensed sentences, tensed sentences can, nevertheless, be translated into *tenseless* sentences without thereby suffering any loss of meaning. This is to say, according to Russell, that the meaning of tensed sentences can be completely captured via the deployment of, in place of the A-determinations to which they appeal, the B-relations of earlier-than and later-than. Thus, “e is past” can straightforwardly be translated into (e.g.) “e (tenselessly) occurs earlier than this utterance” – something which, Russell claims, involves no diminution or alteration in the temporal information thereby conveyed. Moreover, Russell also suggests that the truth of tensed sentences does not depend on the obtaining of a relevant tensed fact (e.g., the truth of the sentence “e is past” does not depend on the obtaining of the tensed fact that e is past). Rather, or so the claim goes, what makes a tensed sentence true is to be specified in B-theoretic terms (i.e., “e is past” is true if e occurs earlier than (e.g.) the utterance of that sentence, and false otherwise). And, since, on this basis, the A-determinations are reducible to B-theoretic notions, not only in conversational usage, but also metaphysically, this would amount to the claim that the A-determinations are no part of fundamental reality. In other words, just as the B-theory proposes, there is no objective metaphysical distinction between futurity, presentness, and pastness (Russell, 1903: 458-476; Russell, 1906: 256-257; Russell, 1915(a): 213, 215, 220-221).

Nowadays, however, most B-theorists do not share with Russell the claim that tensed sentences can be translated into tenseless sentences without suffering at least some loss of meaning. Rather, following (A-theorist) A.N. Prior, take the utterance “*Thank goodness that’s over*” (i.e., thank goodness that’s *past*). Most contemporary B-theorists accept that this utterance carries much greater force than the tenseless translation: “Thank goodness that *that* (say, a visit to the dentist) finished earlier than my saying this”. As Prior asks: “*Why should anyone thank goodness for that?*” (Prior, 1959: 17). Accordingly, the tenseless translation cannot be said to have the same significance, or meaning, as the tensed version. That said, however, even if the meaning of tenseless translations of tensed sentences is now generally thought to be somewhat impoverished, the contemporary B-theorist will still tend to follow Russell in maintaining that it is these tenseless translations which, nevertheless, contain the information which makes the tensed versions true. The B-theoretic claim remains, this is to say, that tensed facts are not required to make tensed sentences true. Accordingly, the B-theorist can continue to claim, with Russell, that our use of tensed sentences provides no evidence that the A-determinations to which they appeal are, in fact, any part of metaphysical reality (the strength of this claim is examined in section 3.4).

2.5 “Change”

To emphasise one particular distinction between the A-theory and the B-theory, it might be noted that, in denying the metaphysical reality of the A-determinations of futurity, presentness, and pastness, the B-theorist is, of course, also denying that events, or moments of time, really change their A-determinations. Relatedly, as was said in section 2.3, in having no notion of a metaphysical present, the B-theorist has no notion of a *moving* metaphysical present. Given this, the B-theory is often described as a “static” theory of time, events occupying fixed moments of time and standing in permanent B-relations to one another. Indeed, the whole B-theoretic world can helpfully be thought of in terms of a four-dimensional, static block. In contrast to the B-theory, however, the A-theory is often characterised as a “dynamic” theory of time. This reflects the fact that, as was said in section 2.2, the idea of events and moments changing, or coming to exhibit, certain metaphysically real A-determinations, and of a moving present, are central to all versions of the A-theory (Prosser, 2016: xi, 1).

In this thesis, I will refer to the notion of events changing their A-determinations (events, that is, moving in time from future to present to past) as “Change” (with a capital “C”). As has been suggested in the previous paragraph, this notion, whilst in need of modification if it is to properly fit some versions of the A-theory, is essentially an A-theoretic notion. Accordingly, I will, for the purposes of this thesis, take mind-independent, metaphysically real Change to be a standardly A-theoretic feature of time.⁶ On the other hand, I will take Change to be something which no standard interpretation of the B-theory can accommodate at a metaphysical level. As will be seen, the question regarding the degree of metaphysical significance rightly to be accorded to Change will be the central consideration of this thesis. As will also be seen, I will claim that the answer to this question does not, contrary to what is conventionally proposed, divide neatly on A-theoretic *versus* B-theoretic grounds.

In thus depicting Change, it might be noticed that what I am calling Change is sometimes described as, for example, “*temporal passage*”, or “*the flow or passage of time*” (Dainton, 2010: 7; Prior, 2003: 9). My adoption of the word “Change” is not intended to indicate any resistance to such descriptions in general. It is, however, intended to distance what I have in mind from, for example, Isaac Newton’s characterisation of temporal passage. Newton posited an “[a]bsolute... time” which “... of itself, and from its own nature flows equably without

⁶ With reference to section 2.2, the Growing Block A-theorist would dispute the aspect of this depiction of Change which refers to *future* events. The presentist’s construal of what I am calling Change will consist just in the constant churn of that which is present.

regard to anything external" (Newton, 1726: 408). Newtonian time, it would thus appear, doggedly ploughs an inexorable furrow, a furrow which it ploughs independently of those events and other things which we think of as being in time. Newtonian time, indeed, would continue along its settled path in a universe completely devoid of events, or motion, or of any other form of change (Bardon, 2013: 52-53). As such, for Newton, "[t]ime" is not just "... *like an ever-rolling stream*"⁷, but actually *is* an ever-rolling stream.⁸ This kind of absolute flow of time, however, is very different to what I mean by Change. To reiterate, what I do mean by Change is the notion of events changing their A-determinations – events, that is, moving in time from future to present to past.⁹

2.6 Concluding comments

In this chapter, having introduced the A-series and the B-series, I have briefly described certain features of the A-theory of time and the B-theory of time. I have also introduced the notion of "Change" as this term will be used in this thesis, namely, as denoting the movement in time of events from future to present to past. Mind-independent, metaphysically real Change, I have suggested, is a standardly A-theoretic feature of time, whilst being incompatible with the B-theory. It has also been said that, based on our intuitions, we might tend to favour the A-theory over the B-theory, since it is the A-theory which more closely matches the way we take the world, and our experience of it, to be.

However, in the next chapter, together with chapter 5, I will suggest that the A-theory might, in fact, be thought vulnerable to certain arguments, both from philosophy and from the physical sciences, which deny the metaphysical reality of the A-determinations and, therefore, of the mind-independent, metaphysically real Change which is central to the A-theory. (As will be seen in chapter 3, whilst the way in which Change is construed by the version of the A-theory known as presentism (section 2.5: footnote 6) renders it immune to some of the philosophical arguments said to have force against other versions of the A-theory, it is suggested that presentism is arguably vulnerable with regard to other considerations.) The arguments of

⁷ From the hymn *Our God, Our Help in Ages Past* by Isaac Watts (1719).

⁸ Newtonian time, as here described, reflects the notion that the time of classical physics is a self-standing container within which events happen, as discussed in section 5.9.

⁹ My usage of the word "Change" in this way accords with McTaggart, who claims that the only characteristics of an event which might be subject to change are its A-determinations (McTaggart, 1908: 460-461).

chapters 3 and 5, therefore, lend support to the B-theory, which has been seen to deny mind-independent, metaphysically real Change. Indeed, it will be claimed in chapter 3 that the world, in not containing mind-independent, metaphysically real Change, is, in this sense, objectively B-theoretic. However, it is also proposed in chapter 3 that the arguments which deny mind-independent, metaphysically real Change, and which therefore lend support to the B-theory, might not, in fact, serve to rule out the prospect of metaphysically significant Change *tout court* – a claim which will then be developed over the remainder of the thesis.

3

Philosophical arguments which deny the metaphysical significance of Change

In chapter 2, I have sought to describe the two main realist philosophical theories of time – namely, the A-theory and the B-theory. A key difference between them has been said to be that all versions of the A-theory posit a version of mind-independent, metaphysically real Change – Change which is objective, and absolute – whereas the B-theory does not. By Change (with a capital “C”) is meant the movement in time of events from future to present to past.

Change, so construed, might be thought to be a natural, and seemingly veridical, feature of our everyday experience – something which seemingly lends support to the A-theory. However, in this chapter, I claim that the A-theory is arguably vulnerable to certain arguments which deny the metaphysical reality of the A-determinations of futurity, presentness and pastness upon which A-theoretic mind-independent, objective, absolute Change would depend. Part 1 of this chapter outlines the seminal argument to this effect by J.M.E. McTaggart – an argument which, I claim, successfully withstands a paradigmatic counterargument brought to bear against it by E.J. Lowe. Part 2 describes a further argument for the unreality of the A-determinations, namely, an argument presented by Hugh Mellor involving the truthmakers of tensed sentences. Mellor’s argument is, I claim, convincing. It is then suggested in Part 3 that, whilst Change as it is construed by those A-theorists known as *presentists* can be thought to avoid McTaggart’s argument, presentism arguably faces other difficulties, in particular in relation to the truthmakers of past-tense sentences. These thoughts are then drawn together in Part 4 where it is suggested that the world, in not containing mind-independent, objective, absolute Change, is, in this sense, objectively B-theoretic. However, it is also proposed in Part 4 that the arguments which deny mind-independent, objective, absolute Change, and which therefore lend support to the B-theory, are, arguably, leaving something out of their accounts of time and, as such, might not serve to rule out the prospect of metaphysically significant Change *tout court*. This proposal will be said to involve the suggestion that the metaphysics of mind, and the metaphysics of time, are correlated.

Part 1 – J.M.E. McTaggart and the unreality of the A-determinations

3.1 McTaggart's Paradox

I have suggested in chapter 2 that, of the two principal realist theories of time (i.e., the A-theory, and the B-theory), it is the A-theory which is the more intuitive. In this Part 1, however, I will consider a famous philosophical argument to the effect that the A-determinations of futurity, presentness and pastness which underpin the A-theory can, in fact, form no part of metaphysical reality – an argument which, if correct, serves to undermine the A-theory. This argument, known as “McTaggart's Paradox”, was first provided by J.M.E. McTaggart in his seminal paper *The Unreality of Time* (1908) and, then, in revised form, in his *The Nature of Existence, Volume 2* (1927).

McTaggart's Paradox can be introduced by noting that McTaggart takes what might be thought of as a strongly A-theoretic view (see section 2.1) in claiming that time must essentially involve Change – i.e., that time must essentially involve events being future, being present, and being past. Crucially, however, or so McTaggart claims, this Change involves a contradiction, since being future, being present, and being past are incompatible ways of being. Hence, no event can really be future, present, and past. Accordingly, futurity, presentness and pastness (which I will sometimes refer to collectively as “the A-determinations”) cannot be metaphysically real features of the universe – and nor, therefore, can Change be such a feature. (It should be noted that the arguments in this section, and in section 3.3, concern those versions of the A-theory other than *presentism* (section 2.2) since presentism, it can be argued, given its particular construal of Change, avoids the difficulties posed by McTaggart's Paradox. Presentism is examined in section 3.5.)

An instinctive riposte to McTaggart is to agree with him that being future, being present and being past are, indeed, incompatible ways of being, but to point out that no one is claiming that an event is all of these ways of being at the same time. McTaggart, however, anticipates this riposte which, he claims, does not help. To seek to defend Change in this way, he notes, is to presuppose the existence of time (NB.: “*at the same time*”). And this is also to presuppose the reality of Change, since time, or so we are assuming, must essentially involve Change. So, it is defending Change by presupposing Change. Accordingly, the riposte is viciously circular and does not address the contradiction. As before, then, Change, along with the A-determinations, cannot be metaphysically real features of the universe (McTaggart, 1908: 467-470; McTaggart, 1927: §306, §329-333). This very brief account of McTaggart's argument will be augmented in section 3.3.

3.2 McTaggart's overarching ontological system

Since McTaggart is claiming that time must essentially involve Change, then, as referred to in section 2.1 (footnote 2), his denial of the metaphysical significance of Change amounts to a denial of the metaphysical reality of time itself (McTaggart, 1908: 470; McTaggart, 1927: §333). In this context, it is of interest to note that the contention that time is unreal can also be derived from McTaggart's overarching ontological system. As Rögnvaldur Ingthorsson notes, McTaggart's account of time comprises a specific application of this overarching system, at the heart of McTaggart's account being the claim that time, conceived as something which essentially involves Change, conflicts with the necessary characteristics of anything which can exist or, equivalently in McTaggart's system, with anything which can be real (Ingthorsson, 1998: 4, 8; McTaggart, 1921: §6; McTaggart, 1927: §298, §325). I will now examine this argument in more detail.

First, how might McTaggart's overarching ontological system be characterised? Crucially, it is a system which is very idealistic in its outlook. Entities might *appear* to be temporal and (in some cases) material, but we should not be fooled (McTaggart, 1921: §52).¹⁰ What there are, though, are existent substances (McTaggart, 1921: §67). Substances, however, cannot exist without having properties and, indeed, properties cannot exist without substances to have them (McTaggart, 1921: §59). Further, all substances stand in relations to every other substance, the relations depending for their existence on the substances and/ or their properties (McTaggart, 1921: §§78-79). Important for present purposes, events comprise one of the various classes of substances (McTaggart, 1921: §5; McTaggart, 1927: §306). Finally, substances can form groups in virtue of some property or relation which is common to them, such groups comprising *compound substances* (McTaggart, 1921: §§127-130). And that's it. Anything which exists – anything contained within “*Absolute Reality*”, as McTaggart terms it (McTaggart, 1927: §296) – must be “... *either an existing substance, a property of an existing substance, a relation holding between existing substances or a compound substance constituted by substances [which] are... parts of reality*” (Ingthorsson, 1998: 9-12 (quote: 12)).

What, then, are the implications of this ontological system as regards time? Well, if time is to exist, then, like anything else which exists, it must fit into one of these categories. As such,

¹⁰ As McTaggart notes regarding the seeming temporality of entities: “*Whenever we judge anything to exist in time, we are in error. And whenever we perceive anything as existing in time – which is the only way in which we ever do perceive things – we are perceiving it more or less as it really is not*” (McTaggart, 1908: 470).

McTaggart has in mind, not so much a world in time but, if time is indeed real, a world with time in it. In line with this, he tells us that time (if real) is constituted by a *series of positions* which events might be said to populate (McTaggart, 1927: §305). That said, for McTaggart, *positions* are not included among those things said to enjoy an independent existence. Accordingly, the existence of a position presupposes there being (say) an event populating it, the position then being determined, geometrically, in terms of relations obtaining between that event and other events. Since the existence of these relations, as with all relations on McTaggart's account, depends on the existence of the *relata*, we can put it that positions rely on extant events both for their existence, and for their geometrical determination (McTaggart, 1927: §306; Ingthorsson, 1998: 11-14).

To this point, it might be noted that there is nothing obviously "temporal" about this supposed account of time (certainly not in any A-theoretic sense). Rather, we merely have a series of positions, each such position being constituted by an atemporal event. To address this, however, McTaggart's claim is that, if time is real, then its reality must involve these events standing in relations to a certain other entity – the relations in question being the relations of futurity, presentness and pastness (McTaggart, 1927: §326, §332). Since, if Change obtains, these relations are impermanent, then it can be seen that, in terms of McTaggart's system, Change will consist in an event's successively constituting different positions as its relation to this other entity changes. Relatedly, for the positions themselves, whether a position is future, present or past is determined by the relation which the event which constitutes that position has to this other entity. As has been said, on McTaggart's account, time is constituted by the series of these positions. Accordingly, in terms of McTaggart's system, time (if real) is a *compound substance*, since the series of positions it consists in are built out of events which are mutually related, and which are all related to the same entity (Ingthorsson, 1998: 14).

Now, however, the crux. We want each event to undergo Change – i.e., we want each event to stand in a continuously changing relation to a certain other entity such that the event might variously exhibit futurity and pastness (including all gradations thereof), as well as a fleeting presentness when appropriate. Moreover, if time is real, we also want a real, extended, A-theoretic time-line along which all of this can happen. Since such a time-line is constituted by what we can think of as the various "A-series positions" (positions stretching from the farthest future to the most distant past), this then requires that every A-series position coexist. Now, as we have seen, each A-series position is determined by an event, and by that event's then-relation to the other entity. So, if we want every A-series position to coexist, then we need every event to stand in all of its finely-graded relations to this entity – and we need them to do so, not successively but, to borrow C.D Broad's word, "*sempiternally*" (Broad, 1938: 307).

Differently put, every event must sempiternally “exist in” every such relation since, failing this, the relations, on McTaggart’s account, cannot exist, and the relation-based compound substance which time consists in will simply evaporate. And there’s the rub. A-theoretic time imports its animated temporal character from the continuous *variation* in relations between events and a certain other entity. But A-theoretic time can only *exist* if all such variations of the relations peacefully *coexist* – in which case the supposed A-theoretic time won’t have a dynamic A-theoretic temporal character and won’t, on McTaggart’s account, be “time-like” at all. On this basis, then, McTaggart’s Paradox can be seen to be derivable directly from his ontology of the nature of the existent. As with the more traditional presentation of the Paradox outlined in section 3.1 (see also section 3.3), what is being demanded of events is that, in standing in these peacefully coexistent relations, they conjointly (yet impossibly) exhibit all of the A-determinations.

A final point on McTaggart’s overarching ontology which it is worthwhile to mention is that, as might have been noticed, I have, throughout the analysis above, ducked the question as to exactly what it might be that comprises the “certain other entity” to which McTaggart suggests, if time (and Change) were real, events would stand in the impermanent relations of futurity, presentness and pastness. On this point, McTaggart declares himself unable to say (and since he denies the reality of these relations, there is no pressing need for him to identify any such entity). He does conclude, however, that, whatever this unknown entity might be, it would have to be something which is itself “*outside the time-series*”, rather than comprising, for example, other events within that series (since, as the B-theorist would agree, the temporal relations obtaining between events are permanent relations) (McTaggart, 1927: §327). A suggested answer to what it might be that comprises McTaggart’s elusive entity will, however, be discussed in sections 6.4 and 8.8.

3.3 A challenge to McTaggart’s argument for the unreality of the A-determinations

As would be expected, McTaggart’s counterintuitive denial of the metaphysical reality of the A-determinations (and hence of Change) has not garnered universal support. Of the various counterarguments which have been brought to bear against it, I will, in this section, consider just one, namely, that provided by E.J. Lowe, which I have chosen in particular as it seeks to challenge McTaggart’s account in a very direct fashion. As in section 3.1, the discussion in this section is with reference to those versions of the A-theory other than *presentism* (section

2.2) which, it can be argued, given its particular construal of Change, avoids the difficulties posed by McTaggart's Paradox. Presentism is examined in section 3.5.

Before addressing Lowe's counterargument to McTaggart, it is first necessary to set out a more detailed analysis of McTaggart's argument than that offered in section 3.1.¹¹ In brief, I have suggested in section 3.1 that McTaggart's central claim is that no event can really be future, present, and past since these are incompatible ways of being. Further, the instinctive riposte that no one is suggesting that an event is all of these ways of being at the same time fails to go through, at least on the assumption (which McTaggart asserts) that time must essentially involve Change. Let us add now, however, that we might seek to press home the instinctive riposte by saying that all that was being suggested in pointing out that no one is asserting that an event is future, present and past at the same time is that, for example, the event in question *was future, is present, and will be past* – three predicates which, surely, are uncontroversial, and which seem perfectly compatible. McTaggart, however, will once again claim that this does not help. Rather, all that it does is to introduce a further six predicates under which (given Change) each event must fall – and some of which, as previously, are *incompatible*.

McTaggart's argument to this effect is brief, and notoriously obscure (as Peter van Inwagen notes: "*There are key sentences in the text in which [McTaggart's] argument is presented that, after ten careful rereadings, are no more than strings of words to me*" (Van Inwagen, 2009: 81). To attempt to flesh it out, however, we might characterise McTaggart's argument as follows:

¹¹ The analysis in this section, and in section 3.4, partly follows that in my (unpublished) paper: *Does McTaggart succeed in demonstrating the unreality of time? If not, how should time be characterised? Can this characterisation be reconciled with our experience of the passage of time?* (2016).

| What we say | What we “mean” | <i>Moon landing, 20 July 1969</i> (“e”) |
|---------------------------|----------------------------------|---------------------------------------------------|
| (1) e was past | (1') e is past in the past | Speaking of yesterday... |
| (2) e is past | (2') e is past in the present | As of now... |
| (3) e will be past | (3') e is past in the future | Speaking of tomorrow... |
| | | |
| (4) e was present | (4') e is present in the past | Speaking of 20 July 1969... |
| (5) e is present | (5') e is present in the present | On 20 July 1969... |
| (6) e will be present | (6') e is present in the future | On 19 July 1969... |
| | | |
| (7) e was future | (7') e is future in the past | Speaking of 19 July 1969... |
| (8) e is future | (8') e is future in the present | On 19 July, 1969... |
| (9) e will be future | (9') e is future in the future | On 18 July, 1969... |

To explain, in the first column, we have the three mooted predicates, shown in bold at lines (3), (5), and (7). But, in deploying these three predicates, we are unavoidably introducing six more of what Michael Dummett terms “*predicates of second level*” (Dummett, 1960: 498). This is because the copulas “will be”, “is” and “was” are not just applicable in lines (3), (5) and (7) but, rather, can each serve to qualify each of “future”, “present”, and “past”. For example, regarding *future*, we can say, not only (as per (7), “e was future”, but also (8) “e is future”, and (9) “e will be future”. Hence the further six lines in the first column.

The second column then reflects that, when we say, for example, that “e will be past” (i.e., (3)), McTaggart is claiming that what this amounts to is our saying that e is “past at some moment of future time”. Less clumsily put, e, this is to say, is past in the future (i.e., (3')). Similarly, (5), “e is present”, is equivalent to saying e is present in the present (i.e., (5')). And (7), “e was future”, corresponds to (7'), i.e., to our saying that e is future in the past (McTaggart, 1927: §331). And likewise for the other six predicates in the second column.

Finally, as regards the third column, the way an event will fall under all nine predicates (if objective, absolute Change does obtain) can be illustrated in the following way. Let us say that “e” is the event of the first moon landing on 20 July 1969. The nine predicates can then be seen to apply to e as follows:

- To start with one of the more intuitive instances, as of now (i.e., as of what is “*now*” for us, here today), (2) is true of *e*: that is, *e* “is past in the present” (i.e., it is past).
- Another fairly intuitive one: on 20 July 1969, one can truthfully say: (5) “*e* is present in the present” (i.e., *e* is present).
- Speaking of yesterday, we can say that: (1) “*e* is past in the past” (i.e., *e* was past), since yesterday is in the past, and *e* was (already) past as of yesterday.
- Speaking of tomorrow, (3), “*e* is past in the future” (i.e., *e* will (still) be past), which is indeed the case.
- Speaking of 20 July 1969, we can say: (4) “*e* is present in the past” (i.e., *e* was present).
- On 19 July 1969, one can truly say that: (6) “*e* is present in the future” (*e* will be present).
- On 19 July 1969, one can also truly say that: (8) “*e* is future in the present” (*e* is future).
- On 18 July 1969 one can say (9) “*e* is future in the future” (*e* will (still) be future on (e.g.) 19 July 1969).
- And, finally, speaking of 19 July 1969 we can say: (7) “*e* is future in the past” (*e* was future).

Now, as McTaggart indicates, some of these predicates of second level are incompatible. Take (2'), (5') and (8') – “*e* is past in the present, present in the present, and future in the present” (i.e., *e* is past, is present, and is future). This, of course, is the very same contradiction which (3), (5) and (7) were introduced to dispel. The same contradiction, this is to say, has simply reappeared at a higher (at the second) level. And any attempt to claim that *e* is not being ascribed (2'), (5') and (8') “*at the same time*” will simply bump the problem up by another level, i.e., to the level where, of the 27 predicates of *third* level, three of them are:

- (2'') is past in the present)
- (5'') is present in the present) ...in the present,
- (8'') is future in the present)

i.e., *e* is past, is present, and is future. And the same will be true at every subsequent level. McTaggart is, therefore, able to claim that we are faced with a regress which is both infinite and vicious. And, accordingly, as with the simpler analysis set out in section 3.1, he is able to conclude that the metaphysical significance of Change is to be rejected (McTaggart, 1927: §§330-333; Dummett, 1960: 497-498). (This analysis of McTaggart’s argument is influenced by one provided by Barry Dainton (Dainton, 2010: 16-17).)

At this point, some may find it tempting to sympathise with Broad's likening of McTaggart's argument to the ontological argument for the existence of God: "... *it is obviously wrong somewhere, but... it may not be easy to say precisely what is wrong with it*" (Broad, 1938: 313). Lowe, however, seeks to address the argument head-on, aiming to refute McTaggart's thesis in its entirety by denying that we face "... *even the appearance of a contradiction in the first place*" (Lowe, 1998: 46). We are not committed, claims Lowe, despite what McTaggart asserts, to saying that every event is past and present and future. At most, all we are committed to saying is that:

"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" (Lowe, 1998: 46).

Thus, for example, if an event is a future event, it: (i') *will be* truly describable as "past", (ii') *will be* truly describable as "present", and (iii') *is* truly describable as "future" (adapted from Lowe, 1998: 46).

McTaggart, as we have seen, would not demur from using, for example, the predicate in (ii') – see McTaggart's predicate (6), above. But McTaggart's argument fails, Lowe maintains, because when we say, from (ii') and (6), that "event *e* will be present", this is not, as McTaggart claims, to say: (6') "event *e* is present in the future". Indeed, such phraseology doesn't just fail to be synonymous, it is "*absurd*" (Lowe, 1992: 325). Descriptions of this type, through their use of "*iterated tenses*", are, Lowe claims, "*simply incoherent*" (Lowe, 1992: 324, 325). Indeed:

"... such iteration does not even make sense. It is... no more intelligible to speak of an event as being "present in the future", say, than it is to speak of an event as occurring "here over there" " (Lowe, 1992: 324).

Speaking of an event as occurring "here over there", of course, Lowe adjudges completely *unintelligible*. If an event *e* is happening at a distance from person *x*, *x* can say, truly, "*e* is happening *over there*". *x* can also agree that, if person *y*, who is right by event *e*, says "*e* is happening *here*", then *y* is speaking truly. But, claims Lowe, it is not legitimate for *x* to say "*e* is happening *here over there*". This would be a "*blatant contradiction*". And, analogously, the statement that "*e* will happen", though implying that in the future it will be possible to make the true statement "*e* is happening now", does *not* imply that *e* is present in the future (Lowe, 1987: 66). Iterated tenses, then, claims Lowe, do not capture any aspect of reality, and McTaggart's

deployment of them to generate a regress is unjustified. Hence, McTaggart's alleged contradiction can be met just with our instinctive riposte from section 3.1 – i.e., that no event is past, present, and future at the same time – and all without our mobilising any regress, vicious or otherwise.

I do not share Lowe's convictions on this. For one thing, whilst I would agree with Lowe that it is clearly convoluted, saying "e is happening *here over there*" is, in terms of its meaning, no different, I suggest, than saying "e is happening *over there*". The "here" is superfluous, rather than its introducing any incoherence. (The phrase might therefore be likened to the phrase "now in a minute", in common usage in Wales. Equivalently, the "now" in this phrase is effectively superfluous.) Moreover, and more pertinent to whether or not McTaggart's iterated formulations are incoherent, we might, for example, consider once more the proposition from predicate (6) (second column version): "e is present in the future". In terms of traditional tense logic, we can construe this as one propositional tense-forming operator (of the form "It will be the case that *p*") modified by another ("It is now the case that *q*"), together giving, in terms of (6): "It will be the case that (it is now the case that e)". This does not entail "It is now the case that e", since "It is now the case that" has narrower scope than does "It will be the case that". (Had they had the same scope, Lowe would be correct to say that the iteration is nonsensical.) However, what it *does* entail is "It will be the case that e" – i.e., "e will be present", our first column formulation of the proposition from predicate (6). Crucially, the *reverse* entailment also holds, and this is what McTaggart implicitly adopts in deriving predicate (6') (i.e., the second column version). In consequence, Lowe's claim that McTaggart's iterated tenses are incoherent is, I suggest, unfounded. Accordingly, I do not believe that Lowe provides a persuasive counterargument to McTaggart's rejection of the metaphysical reality of the A-determinations, and of Change. (This paragraph is influenced by Prior, 1967: 12-15; and Le Poidevin, 1993: 163-164.)

Part 2 – Tensed sentences

3.4 Mellor's account of what makes tensed sentences true

In fact, even if Lowe's counterargument had proved persuasive, there are further arguments supporting the unreality of the A-determinations which do not rely upon the defensibility of McTaggart's iterated tenses and regresses. Consider, for example, facts. Facts, we might suggest, are whatever make truth-conditions obtain (Le Poidevin and Mellor, 1987: 534) – that is, they are "truthmakers". In section 2.4, I alluded to tensed sentences – tensed sentences

being sentences, such as “e is past”, “e is present”, etc., which include A-determinations or conversationally equivalent terms. I also noted in section 2.4 that B-theorists will in general claim that tensed facts (facts such as the fact that e is past) are not required to make tensed sentences true. I will now set out an argument presented by Hugh Mellor which suggests that, not only are tensed facts not required to make tensed sentences true but, in addition, they are wholly inadequate to the task.

This might seem odd, as it seems natural to assume that the truthmakers of tensed sentences are, indeed, tensed facts, since both have time-variable truth-values which might be thought to reliably move in tandem. Mellor notes, however, that the idea that a (single) tensed fact might act as the truthmaker for a tensed sentence, of which there may be multiple token utterances, creates difficulties. Taking Mellor’s example, let e be a race in which a certain Jim participates at 4.30pm. The tensed sentence “e is past” has, let us say, two tokens: “a”, made (prematurely) at 3.30pm; and “b”, made (correctly) at 5.00pm. But these tokens are not made true by a single tensed fact to the effect that e is past. Rather, “a” will always be false, whereas “b” will always be true. In particular, “a” cannot somehow become true when Jim’s race draws to a close, any more than premature reports of Mark Twain’s death can become true at his death. “a” just is a token of “e is past” which is, and always will be, false. “b” just is a token of “e is past” which is, and always will be, true. Hence, it cannot be that there is a single tensed fact which is serving as the truthmaker of each token of the tensed sentence “e is past”.

What actually makes the two tokens true or false is what was touched upon in section 2.4. “b” is made true by the fact that it is later than e. And what makes “a” false is the fact that it is earlier than e. These facts, of course, are B-theory compliant, making no appeal to the A-determinations. Thus, counterintuitively, perhaps, “a” and “b”, and all other tokens of the tensed sentence “e is past”, have tenseless truthmakers, reflecting merely the B-relations. It was suggested in section 2.4 that our habitual recourse to tensed sentences might be reflective of an underlying metaphysical reality as regards the A-determinations to which such sentences appeal. However, since, as Mellor has shown, tensed facts cannot perform the role of truthmaker for these tensed sentences, there is no need to attribute metaphysical reality to the tensed facts – nor to the A-determinations which their metaphysical reality would presuppose. Accordingly, the reality of the A-determinations and, therefore, of objective, absolute Change as it is presented in the A-theory is, once more, denied – and, I believe, persuasively so (Mellor, 1998: 78-81).

Part 3 – A note on presentism

3.5 Presentism and ersatzer presentism

Whilst, in section 2.2, I have positioned presentism as a version of the A-theory, it is worthwhile to note that some of the arguments above which I have found to tell against the A-theory in general can, in fact, be resisted by the presentist. In particular, a convincing case can be made that presentism can avoid McTaggart's Paradox. In this section, I will first set out how this might be done. I will then suggest, however, that the features of presentism which enable it to avoid McTaggart's Paradox arguably introduce certain specific difficulties for presentism centred on the issue of truthmakers for past-tense sentences.

It was seen in section 2.2 that the pivotal claim underlying presentism is the claim that future and past do not exist. Rather, the entirety of reality consists in what is transiently present. On this basis, as was said in footnote 6 to section 2.5, Change is to be construed just in terms of the constant churn of that which is present.

How might we think of McTaggart's Paradox in this context? As Craig Bourne describes McTaggart's Paradox:

“... the root of the problem [posed by McTaggart] is thinking of anything – events, facts, or whatever – as *existing* in ‘the past’ or ‘the future’ – i.e., as already being located there with those ontologically significant tenses” (Bourne, 2006: 75).

Accordingly, as was seen in section 3.3, McTaggart's argument has force against those versions of the A-theory which “... *assert that more than one tense is ever had by an object*” (Bourne, 2006: 75). However, since presentism claims that only what is present is real, presentism does not assert – indeed, presentism *denies* – that this is how the world is. Indeed, in denying the reality of the future and the past, the presentist is agreeing with McTaggart that no event can really be future, present, and past (on the grounds that, for the presentist, events can only really be present). As such, McTaggart's Paradox fails to gain any traction in the world as it is posited by the presentist (Bourne, 2006: 75-76; Le Poidevin, 1991: 33-35). In short, in construing Change just in terms of the constant churn of that which is present, the presentist is not positing the manner of Change which McTaggart is seeking to deny.

On this basis, presentism can justifiably claim, in contrast to the other versions of the A-theory, to demonstrate what Robin Le Poidevin terms “... *immunity to McTaggart's argument*” (Le

Poidevin, 1991: 34). However, in its denying that anything exists in “the past” in any ontologically significant sense, I will now suggest that presentism arguably faces specific problems with regard to the truthmakers for past-tense sentences. In this regard, it would seem intuitive that, say, a (true) statement made today regarding the moon landing on 20 July 1969 depends for its veracity, at least in some sense, on the reality of the event of a moon landing on 20 July 1969. Presentism, however, cannot appeal to this intuition as presentism denies the reality of that event since that event is not happening *now* (Bourne, 2006: 41-46). As Bourne puts it: “... *if there is no such thing as the past, then there is no such thing as a past token to have a truth-value*” (Bourne, 2002: 369 (fn. 5)). Thus, in positing just one real time, the presentist cannot appeal to real past facts. Nor, as Mellor was seen to do in section 3.4, can the presentist appeal to real earlier-than/ later-than relations. What, then, might constitute the truthmakers of past-tense sentences on the presentist account?

Simply put, the presentist is going to have to make the case that everything which is required to serve as a truthmaker for a past-tense sentence is to be found in the present. As J. David Velleman makes this point: “... *the present must, as it were, bear witness to all of history*” (Velleman, 2006: 12). One way in which the presentist can seek to accommodate this is via an appeal to a version of presentism which Bourne terms “*ersatz presentism*” (Bourne, 2006: 52). According to ersatz presentism, times comprise sets of propositions – propositions which represent present, past and future states of affairs. Being sets of propositions, times are *abstract objects*, the only time which is concretely realised being the present. The full range of past and future times, and the events located at them, are therefore represented without any commitment to concrete, non-present entities. And, for example, the truthmaker of the past-tense statement “the moon landing took place on 20 July 1969” is “... *the existence of a proposition that states that this is the case for... [that] time in the past*” (Bourne, 2006: 52-65 (quote: 52)).

One virtue of ersatz presentism is, as Bourne notes, its ontological parsimony. For example, unlike (say) the B-theory, it makes no appeal to equally real concrete past and future times (and since, Bourne suggests, we are all committed to the existence of abstract objects of some description, the ersatz presentist’s positing of abstract objects does not detract from this ontological parsimony) (Bourne, 2006: 68, 223). That said, however, certain objections can be raised to ersatz presentism. For example, M. Joshua Mozersky questions how the posited truthmaking propositions can be known to be representing the past accurately. Yes, we have a proposition representing there having been a moon landing on 20 July 1969, but how do we know that there really was such a moon landing? The proposition does secure the existence of what might be called an “ersatz moon landing”, but it does not guarantee that the

moon landing was once *concrete*. Indeed, a proposition could represent there having been (say) a victory for Napoleon at Waterloo in 1815, and thereby secure the existence of such “ersatz victory”, despite that event’s never actually having been concrete (Dainton, 2010: 95). On the assumption that we would expect true past-tense sentences to necessarily involve events which were once concrete, the presentist would, therefore, seemingly need to provide a separate truthmaker for an ersatz event’s having been concrete – a truthmaker which Mozersky finds them unable to provide. In response, the presentist might seek to maintain that it is simply a brute fact that the existence of an ersatz event requires that the event in question was once concrete. However, given that the posited truthmaking propositions cannot have any real connections to the (non-existent) past and its then-concrete past events, such a stipulation would, Mozersky suggests, appear merely *ad hoc* (Mozersky, 2013: 177; Bourne, 2006: 65; Dainton, 2010: 93-95). Further potential difficulties for presentism in general are discussed in sections 5.2 to 5.4, and 5.10.

Part 4 – Concluding comments

3.6 McTaggart and a complete description of reality

I have suggested in this chapter that there are persuasive arguments which tell against the notion of mind-independent, objective, absolute Change as it is presented in the A-theory. In particular, it has been claimed that there are persuasive arguments which tell against the metaphysical reality of futurity, presentness and pastness upon which mind-independent, objective, absolute Change would depend. Whilst the version of the A-theory known as presentism has been seen to construe Change in a way which avoids some of these arguments, presentism has been said to potentially face specific difficulties regarding the truthmakers of past-tense sentences. The suggestion to this point, therefore, is that the A-theory is unpersuasive and that time, if it is real, must be time as it is characterised by the B-theorist (section 2.1). Hence, despite the counterintuitive features of B-theoretic time described in sections 2.3 to 2.5, the suggestion is that the world, in not containing mind-independent, objective, absolute Change, is, in this sense, objectively B-theoretic.

However, what I want to introduce in this section is the idea that the picture is not, in fact, as clear-cut as the previous paragraph might suggest. In this regard, it is of interest to look at the context in which McTaggart situates his argument for the unreality of futurity, presentness and pastness, and of objective, absolute Change. As Dummett notes in his analysis of McTaggart’s argument, “... *McTaggart is taking it for granted that reality must be something*

of which there exists in principle a complete description" (Dummett, 1960: 503). Such a complete description can be thought of as a description which reflects how the world is in and of itself, "... *a conception of reality*", as Bernard Williams has expressed the notion, "... *corrected for the special situation or other particularity of various observers*" (Williams, 1978: 241). Hence, as Dummett puts it, for McTaggart, "... *[t]he description of what is really there, as it really is, must be independent of any particular point of view*" (Dummett, 1960: 503). It must be a description of reality, that is to say, which characterises the way the world is in an absolute, non-relativised sense. And indeed, it has been seen in section 3.2 that what McTaggart calls "*Absolute Reality*" (McTaggart, 1927: §296), in comprising merely substances, properties of substances, relations holding between substances, and compound substances, does indeed conform with the impartial description which Dummett suggests on McTaggart's behalf.

This enables us to consider McTaggart's argument in a different way. In section 3.4, consideration was given to tensed facts. Tensed facts are, as Dummett expresses it, "... *facts into the statement of which temporally token-reflexive expressions enter essentially*" (Dummett, 1960: 500).¹² Since tensed facts are, this is to say, relativised to particular circumstances, then they cannot be brought within an absolute, complete description of reality such as McTaggart's. Accordingly, consistently with McTaggart's arguments concerning time as set out in sections 3.1 and 3.3, neither tensed facts, nor the A-determinations to which they appeal, can be any part of McTaggart's reality (Dummett, 1960: 500-503).

It is of interest to press McTaggart's line of thinking somewhat further. In implying that, within a complete description of reality, there are no tensed facts or A-determinations, McTaggart is asserting, to adopt a quote from Zeno Vendler (made independently of any consideration of McTaggart), that: "... *whether something is past, present, or future, makes no difference to the world*" (Vendler, 1984: 97). At first, this might seem odd. Does the world's-eye view really not, for example, distinguish what is *present* – distinguish what is going on *now*? But, as McTaggart might point out, why, in fact, should the world's-eye view have any special interest in what is going on *now*? The world's-eye view is not a presentist, and is not even in possession of a moving spotlight (section 2.2). Rather, the world's-eye view can contemplate

¹² As Dummett explains it: "*A token-reflexive expression is one like "I", "here", "now", whose essential occurrence in a sentence renders that sentence capable of bearing different truth-values according to the circumstances of its utterance – by whom, when, and where it is uttered, to whom it is addressed, with what gestures it is accompanied, and so forth*" (Dummett, 1960: 499). I will also use the term "indexical" to refer to what Dummett is calling a token-reflexive expression.

any moment it chooses, for that is how the world is laid out before it. *All* moments are in the world and, *sub specie aeternitatis*, there is nothing special about which moment is *now*. Indeed, there is nothing in the world's-eye view's representation of the world which singles out the *now*, such considerations playing no part in the individuation of events. The universe does not differentiate *spatial* locations as being "*here*", as opposed to their being "*there*". Rather, as Adrian Bardon puts it, from the point of view of the universe, "... *things are just where they are*" (Bardon, 2013: 174). And, "... *[from] a purely objective standpoint... there is no more fact of the matter as to what time is 'now' than there is with regard to what place is 'here'*" (Bardon, 2010: 59). *Sub specie aeternitatis*, "*now*", like "*here*", is just another indexical with no bearing on how the world really is (Vendler, 1984: 96-98).¹³ This characterisation, indeed, accords with its having been said above that the world is a world which is objectively B-theoretic.

Against the backdrop of a world-view such as this – a world-view involving an impartial, non-relativised version of reality which is independent of any consideration of particular observers – McTaggart's argument does, I believe, succeed. But the Vendler quote above (i.e.: "... *whether something is past, present, or future, makes no difference to the world*") does not, in fact, end there. Rather, Vendler continues: "... *but to me it makes all the difference*" (Vendler, 1984: 97). And what I want to claim is that the success of the arguments, including those of McTaggart, against the metaphysical reality of Change depends on the extent to which the second part of Vendler's quote is, as it were, taken seriously. For the B-theorist, the second part of Vendler's quote is to be attributed nothing more than psychological significance. But what I will claim over the remainder of this thesis is that the B-theory, and the arguments that tell against objective, absolute Change and thereby lend support to the B-theory, are, arguably, leaving something out of their accounts of time. As such, they might not serve to rule out the prospect of metaphysically significant Change *tout court*. This claim will be made in the terms that, at least with reference to certain accounts of experiencing subjects, the second part of Vendler's quote is, I will suggest, to be attributed, not psychological, but metaphysical significance, since such accounts of experiencing subjects, I will claim, essentially involve Change which is metaphysically significant. Since, I will claim, this is not the case with all accounts of experiencing subjects, this is also to suggest that there is a connection between the topic of the experiencing subject, and the topic of Change – something which suggests more generally that the metaphysics of mind, and the metaphysics of time, are correlated. An argument to this effect will now be constructed over the remainder of the thesis.

¹³ This analysis can be seen to accord with the Kurt Vonnegut quote in section 2.3 (Vonnegut, 1969: 22).

4

Introducing frames of reference

In chapter 3, it has been claimed that there are persuasive arguments which tell against the notion of mind-independent, objective, absolute Change as it is presented in the A-theory – arguments which were, therefore, said to lend support to the B-theory. Relatedly, it was claimed that the world, in not containing mind-independent, objective, absolute Change, is, in this sense, objectively B-theoretic.

However, it was also proposed in chapter 3 that the B-theory, and the arguments which tell against mind-independent, objective, absolute Change and thereby lend support to the B-theory, might be leaving something out of their accounts of time. In particular, it was suggested that some, though not all, accounts of experiencing subjects might essentially involve Change which, rather than being mere appearance as the B-theorist would contend, is metaphysically significant. To get this idea off the ground, I want first, in this chapter, to suggest that Change is something that can be characterised as frame-relative. With this in mind, it is suggested in sections 4.1 and 4.2 that, just as, following Galileo Galilei, the motion of objects in space is understood as being something to be assessed relative to a particular frame of reference, so, too, can Change be assessed relative to particular frames of reference. In particular, it is suggested that, relative to an “objective temporal frame of reference” such as might be thought to underpin the metaphysics of the B-theory, Change does not obtain. Relative to what I call the “subjective temporal frame of reference”, however, Change does obtain. Section 4.3 then sets out the basis on which, over the remainder of the thesis, arguments will be constructed to support the idea that the Change which obtains relative to the subjective temporal frame of reference is, with reference to certain accounts of experiencing subjects, to be accorded metaphysical significance whilst, with reference to other accounts of experiencing subjects, it is not. This will also be to suggest that the question of the metaphysical significance of Change is best considered alongside a consideration of the nature of the experiencing subject.

4.1 The motion of objects in space

Let us consider the motion of objects in space. Two such objects are the sun and the earth and, in the second century, the astronomer and mathematician Claudius Ptolemy was to devise a model of the solar system in which the sun, along with the other stars and the planets, revolves around the earth. According to this “geocentric” account, the earth is the centre of the universe. As such, the earth is motionless, whilst the sun, the other stars, and the (other) planets, are in motion around it.

Ptolemy's view was the prevailing view for some 1,200 years. However, in the sixteenth century, Nicolaus Copernicus (building on the work of astronomers such as Aristarchus of Samos, who predates Ptolemy) proposed, in contrast to Ptolemy's geocentric system, a “heliocentric” system, in accordance with which the sun is at the centre of our system, with the earth and the other bodies revolving around it. Copernicus's model was cemented into scientific (if not religious) thought by the further work of Galileo Galilei, a hundred or so years later.

The point at issue between Ptolemy and Copernicus can be expressed via the positing of two sets of coordinates, each defining a frame of reference. One frame of reference (that of Ptolemy) has the earth as its point of origin. The other frame of reference (that of Copernicus) has the sun as its point of origin. In terms of the frame of reference with the earth as its point of origin, the earth does not move (is at rest), but the sun does move. Correspondingly, in terms of the frame of reference with the sun as its point of origin, the sun does not move (is at rest), but the earth does.

Endorsing one or other of the divergent views of Ptolemy and Copernicus would seem to be a clear-cut, and binary, matter. After all, it would appear that only one of them can be “right”. Indeed, the strength of feeling surrounding this debate led to Galileo being tried for heresy by the Roman Inquisition (a system of tribunals operated by the Holy See of the Roman Catholic Church), to then be put under house arrest and forced to recant his advocacy of heliocentrism.

Despite this, however, Galileo's thinking was not, in fact, exclusively along heliocentric lines. Whilst it would not prove possible to incorporate it into a comprehensive physical system until Albert Einstein derived his general theory of relativity (see chapter 5), Galileo also considered what, in effect, amounts to the idea that, perhaps, after all, it is *not* the case that only one of Ptolemy and Copernicus can be “right”. Rather, the point at issue can be expressed by saying that, relative to the Ptolemaic frame of reference centred, as it is, on the earth, the sun is in

motion but the earth is not. Equivalently, relative to the Copernican frame of reference, centred on the sun, the earth is in motion but the sun is not. As to who is right – as to whether it is the sun or the earth that is *really* moving – the answer then becomes: we cannot say; there just is no fact of the matter. We can say that the two frames of reference are in *relative* motion with respect to one another but, as to whether it is the earth, or the sun, which is to be afforded the status of “really moving”, it simply depends on which of the frames of reference you chose to invoke. On this basis, the motion of objects in space is rightly to be thought of as a frame-relative notion – a notion which can only be described relative to a particular frame of reference (Einstein and Infeld, 1938: 211-214).

4.2 The movement of events in time

So much, then, for the motion of objects in space. But what about the movement of events in time from their being future, to their being present, to their being past (what about, that is to say, Change)? Might there be a role for particular frames of reference in the temporal domain, too?

To begin this consideration, I argued in chapter 3 that there are persuasive arguments that tell against the A-theory – a claim which works to the advantage of the B-theory. On this basis, the frame of reference which first presents itself as regards the temporal domain is, I suggest, a B-theoretic frame of reference. With this in mind, let us take a particular event – the event, let us say, of the death of Queen Anne in 1714 (McTaggart, 1908: 460). According to the B-theory, as was seen in chapter 2, time is constituted by the permanent B-relations of earlier-than and later-than. As such, the event of the death of Queen Anne is said to occupy a fixed moment of time, relative to which other events are either earlier, or later. Whether these other events are earlier than, or later than, the event of the death of Queen Anne, and by how much they are earlier or later than that event, will not be matters which are subject to change. To express this in terms of a temporal frame of reference, then, we can envisage the event of the death of Queen Anne as constituting the point of origin of such a frame, with the other events occupying other positions defined in relation to that point of origin by temporal coordinates specified in terms of the dimensions of earlier-than and later-than.

I will hereafter call this B-theoretic frame of reference the “objective temporal frame of reference” (or abbreviations thereof). To tighten up the description of it, it can be said that the objective temporal frame of reference is defined by *the permanent B-relations of earlier-than and later-than in which events stand to one another*. As this description implies, it is not, of

course, crucial to the objective temporal frame of reference that the event of the death of Queen Anne constitutes its point of origin – any other event could instead be taken as doing so. It is also apparent, I think, that, whatever the choice of the point of origin, there is nothing about this frame of reference suggestive of Change. Rather, as would be expected given its B-theoretic provenance, all events, including the event at the point of origin, stand in fixed relations to one another (such relations now being expressed by the events' respective temporal coordinates), and do so eternally.

What I now want to suggest, however, is that it might not be implausible to countenance an alternative temporal frame of reference in terms of which Change *does* obtain. The basic idea will be that, in like manner to Galileo's various spatial frames of reference, this alternative frame of reference is in motion relative to the objective temporal frame of reference. And it is this notion of the alternative temporal frame of reference being in motion relative to the objective temporal frame of reference which will underpin the notion of Change.

To introduce this idea, I want, first, to consider a claim made by Bertrand Russell, which McTaggart reports as follows:

“... past, present, and future do not belong to time *per se*, but only in relation to a knowing subject. ...If there were no consciousness, there would be events which were earlier and later than others, but nothing would be in any sense past, present, or future. ... if there were events earlier than any consciousness, those events would never be future or present, though they could be past” (McTaggart, 1927: §313).

Indeed, as Russell himself addresses the point:

“... past, present, and future arise from time-relations of subject and object, while earlier and later arise from time-relations of object and object. In a world in which there was no experience there would be no past, present, or future, but there might well be earlier and later” (Russell, 1915(a): 212).

As was seen in section 2.4, Russell is, essentially, a B-theorist, and he is not, therefore, suggesting that the roles which pastness, presentness and futurity play in conscious experience provides any evidence for their mind-independent, objective, absolute reality (as a B-theorist, he, of course, denies any such thing). Nevertheless, this allusion to conscious experience, and to knowing subjects, does, I suggest, provide an indication as to how an alternative to the objective temporal frame of reference might be characterised. We might

think of the event of the death of Queen Anne, this is to say, from the perspective, not of other events, but, rather, from the perspective of what we can characterise, in (for current purposes) some very general sense, as an ordinary human subject pursuing an ordinary course of experience through the world. Unlike the death of Queen Anne, there is no meaningful sense in which this ordinary human subject occupies a “fixed moment of time”. Rather, the subject, temporally speaking, occupies what is to them, at least, a moving present. And, just as we can posit an objective temporal frame of reference with the event of the death of Queen Anne at its point of origin, what I now want to suggest is that we can equally posit a temporal frame of reference with the subject at its point of origin. Since the subject occupies what is to them, at least, a moving present, this alternative temporal frame of reference would not seem to be static, or fixed, in the way that the objective temporal frame is. Indeed, the point of origin of this alternative frame (i.e., the subject’s moving present) and, therefore, the alternative frame of reference as a whole, can rightly be said to be in motion relative to the objective temporal frame – the subject, from the perspective of the objective frame, scuttling along, as it were, atop the static, B-theoretic objective time-line, in the direction of later and later events. I will hereafter refer to this alternative temporal frame of reference as the “subjective temporal frame of reference” (or abbreviations thereof).

I have stated above that there is nothing in the depiction of the objective temporal frame of reference which is suggestive of Change. The position *vis-à-vis* the subjective temporal frame of reference, however, seems quite different. Relative to the subjective temporal frame, centred, as it is, on a subject’s moving present which scuttles ever later-wards, events which, from the perspective of the subject’s moving present, were once-future, become present events, and once-present events become past events. Relative to the subjective temporal frame of reference, this is to say, there *is* Change. And, since there is no Change relative to the objective temporal frame of reference, it can be said, equivalently to the idea set out in section 4.1 whereby the motion of objects in space was said to be a frame-relative notion, that Change, too, can be characterised as being frame-relative. Relative to the objective temporal frame of reference, this is to say, Change does not obtain. But relative to the subjective temporal frame of reference, it does.

Certain points are worthwhile to stress at this point. First, it has been said that the posited subjective temporal frame of reference is in motion relative to the objective temporal frame of reference. And this is correct. However, whilst it might sound the more animated choice of the two, this is not to say that the subjective temporal frame is in motion in any absolute sense. It is, indeed, in motion relative to the objective temporal frame (and, therefore, relative to the events embedded within the objective temporal frame). But what this also amounts to saying

is, of course, that the objective temporal frame (and the events) are in motion relative to the subjective temporal frame. As with Ptolemy and Copernicus, neither frame is *really* moving in any absolute sense, but both are moving in a relative sense. That said, however, it is important to note that this does not mean that the objective temporal frame has, in consequence, lost its static, fixed credentials. It hasn't. But we do need to recognise that these credentials have been expressed just in terms of the fixedness of the moments of time which events occupy, and of the unchanging nature of the earlier-than/ later-than relations in which they stand to one another. The objective temporal frame's being in relative motion, therefore, should not be thought of as introducing any sense of Change, or any other form of vivacity, within the confines of the objective temporal frame itself.

Another point to stress is that, in referring, in the context of the subjective temporal frame of reference, to a moving present, this should not be taken to be a reference to the moving present as it is presented in the A-theory. As was shown in section 2.2, the moving present as it is presented in the A-theory is something with mind-independent, objective, absolute standing which arises independently of any consideration of the human subject. But, as can be seen above, I have couched the moving present in terms which very much depend upon the human subject.

In this sense – in my couching the moving present in terms which very much depend upon the human subject – it might, indeed, be thought that I am not saying anything to which the B-theorist need object. After all, the B-theorist, whilst denying the metaphysical significance of Change, would not deny that human subjects do, in some sense, experience a moving present and, concomitantly, experience Change (indeed, the quote from Russell above supports this view). Such experience the B-theorist considers to be mere appearance and, as such, non-veridical. But the B-theorist could, nevertheless, embrace the idea of the subjective temporal frame of reference. They would wish to make clear that, in contrast to the B-theoretic, objective temporal frame of reference, no metaphysical significance is to be attributed to the subjective temporal frame of reference, but the subjective temporal frame of reference could, nevertheless, be deployed as a device by which to illuminate the notion that Change is an apparent feature of an experiencing subject's experience – a notion to which the B-theorist, in any case, subscribes.

In this regard, a strong characterisation of apparent Change in a B-theoretic context is to be found in the version of the B-theory provided by Hugh Mellor, a version which goes so far as to posit "... *if not a real flow of time, then a real, and often true, experience of time flowing [i.e., of Change]*" (Mellor, 1998: 67). Mellor locates this "*real*" experience of Change in changes in

our beliefs – specifically, changes in our “A-beliefs”, i.e., those beliefs which concern the times of events specified in relation to “*now*”, such as “event *e* will happen *tomorrow*”, or “event *e* happened *a hundred years ago*”. The belief that *e* is happening “*now*” is also an A-belief and, indeed, the “getting” of those A-beliefs which are also “*now*”-beliefs is, on Mellor’s account, of particular importance, not just to the nature of our experience, but also to the appropriateness of our actions. Turning on the radio to hear the six o’ clock news, for example, requires not just the belief that the news starts at six, but also the getting of the belief that it is six *now*. And, on this basis – on the basis of our changing A-beliefs, and of their connection to our successful timely actions – Mellor concludes that we can believe, “*successively, and truly*”, that the news programme is future, present, and past (Mellor, 1998: 8-10, 23, 64-69 (quote: 69)). J. David Velleman concludes similarly that: “Time truly passes, in the sense that it passes *me*” (Velleman, 2006: 13). Re-expressing Mellor’s, and Velleman’s, accounts on the basis of the experiencing subject being located at the point of origin of some form of subjective temporal frame of reference, as such frames have been depicted in this chapter, would, I suggest, be a straightforward matter.

4.3 Concluding comments

On this basis, then, it does indeed seem that the B-theorist could embrace the idea of some form of subjective temporal frame of reference, and even a notion of true Change obtaining relative to it. But, to be clear, this would not be to say that they are endorsing any form of Change which is metaphysically real. As was said in section 4.2, the B-theorist would not wish to attribute metaphysical significance to a subjective temporal frame of reference (and, indeed, in Mellor’s case, we have seen him to provide arguments which might be used to *deny* the metaphysical significance of a subjective temporal frame of reference in section 3.4). Hence, whilst Mellor is claiming that our A-beliefs play an irreducible and indispensable part in our being successful timely agents, their indispensability has, on his account, a merely psychological explanation. He is not claiming, this is to say, that our A-beliefs reflect metaphysically significant relations in which events stand to a metaphysically significant “*now*”. The radio news does not *really* change from being future, to being present, to being past, from a metaphysical perspective. Rather, Mellor suggests that the changes in our A-beliefs:

“... embody the psychological truth in the metaphysical falsehood... that events... really are moving... from being tomorrow, to being today, to being yesterday...” (Mellor, 1998: 66).

Accordingly, on Mellor's account, in opposition to the A-theory, Change is being "... *put back where it belongs – in our minds*" (Mellor, 1998: 73). And, for Velleman, too, Change has no metaphysical significance, its being, on Velleman's account, an illusion predicated on the further illusion that we exist as enduring selves (this further illusion, he claims, resting on the structure of our experiential memory and our anticipations) (Velleman, 2006: 5-8).

Accordingly, whilst subjective temporal frames of reference can, I suggest, be readily deployed within B-theoretic accounts, it would need to be made clear that such subjective temporal frames of reference, and the Change which obtains relative to them, are of psychological significance, but are not of metaphysical significance. The subjective temporal frame of reference, and the Change which it involves, would serve, it might be put, to describe the way in which we navigate the world, but would not form any part of an explanation of how the world is from a metaphysical viewpoint. This, however, brings me to the principal claim of this thesis. What I will be claiming in this thesis is that if the way in which we navigate the world is *as it is described in certain accounts of experiencing subjects*, then it has to be a world which contains Change of a metaphysically significant kind. This is because, I will claim, metaphysically significant Change is an essential prerequisite of perceptual experience as it is characterised by these accounts. And, since I have proposed in chapter 3 that the world is a world which does not contain A-theoretic mind-independent, objective, absolute Change, and since I thereby agree with the B-theorist that Change obtains just with reference to an experiencing subject, this is equivalently to claim that, in terms of such accounts of experiencing subjects, the subjective temporal frame of reference, and the Change which obtains relative to it, are, *contra* the B-theorist, to be accorded metaphysical significance. Moreover, since I will claim that this is not the case with all accounts of experiencing subjects, this is also to suggest that the question of the metaphysical significance of Change is best considered alongside a consideration of the nature of the experiencing subject. This proposal can be summarised, and contrasted with the A-theory and the B-theory, as follows:

- The A-theory considers Change to be mind-independently metaphysically real, and attributes this just to the nature of time. Any consideration of the experiencing subject is orthogonal to the notion of Change.
- The B-theory denies the notion of mind-independent Change, instead considering Change to obtain relative to a subjective temporal frame of reference, and to invariably be mere appearance. The non-existence of metaphysically significant Change is due to the nature of time, and is independent of any consideration of the nature of the experiencing subject occupying the subjective temporal frame of reference.

- The proposed account joins the B-theorist in denying the notion of mind-independent Change and in considering Change to obtain relative to a subjective temporal frame of reference. However, the proposed account then claims that the question of whether Change is metaphysically significant must take into account the nature, not only of time but, also, of the experiencing subject. With reference to certain accounts of experiencing subjects, the Change obtaining relative to the subjective temporal frame of reference is mere appearance, as the B-theorist claims. But, with reference to other accounts of experiencing subjects, such Change is metaphysically significant.

In claiming that, with reference to certain accounts of experiencing subjects, the subjective temporal frame of reference, and the Change which obtains relative to it, are to be accorded metaphysical significance, the suggestion is that, with reference to those accounts, the subjective temporal frame of reference is to be granted equal ontological standing with the objective temporal frame of reference. This might be compared with Galileo's showing that the Ptolemaic, and the Copernican, spatial frames of reference share equal ontological standing (section 4.1). In this regard, however, one advantage which Galileo has over me is that both of his frames of reference are *objective* frames. This is to say, therefore, that, unlike me, he is not seeking to demonstrate an equality of ontological heft between an objective frame and a subjective frame. And, indeed, I recognise that, at this juncture, there might be a tendency to favour the objective temporal frame over the subjective one. A metaphysically significant subjective temporal frame of reference might, perhaps, be coming across as merely an add-on which I am seeking to foist onto an already fully-specified world (from section 3.6, J.M.E. McTaggart would certainly be of this view). Moreover, it will be seen in chapter 5 that it is not only the philosophical arguments of chapter 3, but also arguments from the physical sciences, which seem to tell against the notion of metaphysically significant Change.

With this in mind, one step to be taken before getting onto the claim that some, though not all, accounts of experiencing subjects presuppose metaphysically significant Change is to secure the notion that one and the same domain can, as I am proposing, be legitimately and equivalently described in terms of both a subjective, and an objective, frame of reference. This will be the task of chapter 6. Since, as has been suggested, it might be thought that the comparison I have drawn with Galileo's spatial account is deficient inasmuch as Galileo appeals only to objective frames, I will, in chapter 6, first consider this matter in relation to the spatial domain. This I will do via an analysis of Gareth Evans's account of demonstrative identification, an account which, as will be seen, involves both a subjective, and an objective, spatial frame of reference (Evans, 1982). I will then show that it is possible to apply Evans's methodology, not only as regards space, but also as regards time. In this way, Evans's

account will be shown to support the idea that the temporal domain can legitimately and equivalently be described in terms of both a subjective and an objective frame of reference. This analysis will also serve to generate a characterisation of the subjective temporal frame of reference which is more comprehensive than the rather sketchy depiction presented in this chapter.

The analysis in chapter 6 will, however, leave open the question as to whether, with reference to at least some accounts of experiencing subjects, the subjective temporal frame of reference is to be accorded metaphysical significance or whether, instead, it is only ever of interest at, for example, a psychological level. This will be addressed in chapters 7 and 8, where arguments will be constructed to the effect that some, though not all, philosophically respectable accounts of experiencing subjects do, as I am suggesting, essentially presuppose metaphysically significant Change – metaphysically significant Change which, following the proposal from chapter 3 to the effect that the world, in not containing mind-independent, objective, absolute Change, is, in this sense, objectively B-theoretic, presupposes, I will claim, the metaphysical significance of the subjective temporal frame of reference.

Before getting on to these matters, however, I will first, in chapter 5, set out further arguments, additional to those in chapter 3, to which the A-theoretic notion of objective, absolute Change appears vulnerable. These arguments emanate from the physical sciences – in particular, from the relativity theory principally associated with Albert Einstein. As will be seen, central to these arguments is the notion of equally-justified objective frames of reference – something similar, therefore, to what has been seen as regards Galileo in section 4.1. I will also in chapter 5 set out grounds for claiming that relativity theory, despite its denial of objective, absolute Change, need not be thought to rule out the notion that, as I am proposing, Change of a metaphysically significant kind can obtain relative to a particular frame of reference, such as the subjective temporal frame of reference.

5

Arguments concerning relativity theory

In chapter 3, I have claimed that the A-theory appears vulnerable to certain philosophical arguments which deny the notion of objective, absolute Change. In this chapter, I argue that these philosophical arguments are further supported by arguments emanating from the physical sciences – from, in particular, the relativity theory principally associated with Albert Einstein. This is because, as is set out in Part 1 of this chapter, the special theory of relativity, in demonstrating that simultaneity is a relative relation rather than an absolute relation, serves to deny the absolute presentness which objective, absolute Change involves. It is also argued in Part 1 that the general theory of relativity does not serve to restore objective, absolute Change, as some have claimed. In Part 2, it is suggested that certain counterarguments brought to bear against the arguments of Part 1 are unsuccessful. Accordingly, as was the case in chapter 3, the suggestion is that the A-theory appears unpersuasive, the world being a world which, in not containing mind-independent, objective, absolute Change, is, in this sense, objectively B-theoretic.

Part 3 of this chapter then seeks to demonstrate that relativity theory, in denying mind-independent, objective, absolute Change, does not, in so doing, rule out the idea, as proposed in this thesis, of metaphysically significant Change obtaining relative to a particular frame of reference such as the posited subjective temporal frame of reference. To this end, arguments are presented which seek to demonstrate that relativity theory, whilst it successfully provides, in a simplest form, a formulation of the laws of nature, it is not also seeking to provide a complete metaphysical description of all of those things to which it makes reference. Rather, it is suggested, certain ingredients of relativity theory are deployed, and characterised, in the interests of the elucidation of the theory as a whole, rather than because they arise as a consequence of the theory, or because the theory is intended to provide a complete specification of them. In particular, the spatiotemporal metrical structure applied to the manifold of events has, I suggest, been introduced into relativity theory so as to allow for a physical interpretation of the systems of coordinates to which the theory appeals, rather than in the interests of metaphysical veracity.

To this end, Part 3 of this chapter proceeds as follows. Section 5.6, building on the analysis in Part 1, provides a further description of various pertinent features of relativity theory. In section 5.7, I propose, based upon an argument presented by Adolf Grünbaum, that continuous spacetime is “*intrinsically metrically amorphous*” – i.e., that no illuminating metric relation pertaining to continuous spacetime emanates just from the nature or character of continuous spacetime itself (Grünbaum, 1973: 498). Section 5.8 then demonstrates that Grünbaum’s conclusion to this effect is consistent with what Einstein has said in this regard. In section 5.9, it is suggested that, whereas, in terms of Hermann Minkowski’s paradigmatic characterisation of the special theory, special relativistic spacetime is afforded an existence independent of its contents, this is not the case with general relativistic spacetime. On this basis, it is proposed in section 5.10 that the characterisation of spacetime (and of time) provided by relativity theory is not intended to rigorously delimit such characterisation as it might be stated from the perspective of metaphysical reality. Accordingly, despite the perhaps unrivalled explanatory and predictive power which it wields, relativity theory, I suggest, need not be thought to countermand the prospect, which this thesis seeks to defend, of metaphysically significant Change obtaining relative to a particular frame of reference such as the subjective temporal frame of reference. It is also argued in section 5.10 that the claim that physics does not delimit the boundaries of metaphysics cannot be successfully applied so as to restore the notion of mind-independent, objective, absolute change as it is presented in the A-theory.

Part 1 - Arguments from physics which deny the metaphysical significance of Change

5.1 The special theory of relativity

In chapter 3, I have argued that both J.M.E. McTaggart’s, and Hugh Mellor’s, rejection of the metaphysical significance of the A-determinations of futurity, presentness and pastness, and hence of objective, absolute Change as it is presented in the A-theory, are persuasive. Since McTaggart claims that time essentially involves Change, his denial of the metaphysical significance of Change amounts, on his terms, to a denial of the metaphysical reality of time itself (McTaggart, 1908: 470; McTaggart, 1927: §333). However, like Mellor, we need not follow McTaggart in reaching this stark conclusion. Rather, as discussed in section 2.1, we can, for example, follow the B-theorist in making the argument that metaphysically real time can obtain *without* Change, time as such being constituted merely by the B-relations of earlier-than and later-than – relations which do not presuppose the reality of the A-determinations. On this basis McTaggart’s arguments can be construed as amounting to a denial of objective,

absolute Change and, therefore, of the A-theory – but to fall short of being a denial of the reality of time itself.

This B-theoretic position that, whilst Change is not metaphysically real, time, nevertheless, is metaphysically real, is generally held to be consistent with the depiction of time revealed in the physical sciences – in particular, in relativity theory, as famously promulgated by Albert Einstein. Accordingly, it is unsurprising that B-theorists often turn to the arguments from relativity theory in bolstering support for their claims. It is to relativity theory that I will now turn.

To introduce, first, the special theory of relativity, we might consider, say, an event, such as a stone being dropped from the top of a tower. Such an event can be construed from different viewpoints, or perspectives. The stone, for example, will land at a different spatial distance from an observer trying to get out of its way at the base of the tower than from another observer watching from across the town square. But these two perspectives seem readily inter-translatable just as, for example, one person's "here" and another person's "there" are readily inter-translatable. One observer's *coordinate system*, we might say, at the origin of which they find themselves to be, can straightforwardly be re-expressed in terms of another observer's coordinate system. And, provided the transformation between the two systems of coordinates is properly performed, we would not anticipate that the laws of nature would turn out to be any different in one system than in the other. Natural phenomena, we might say, run their course with respect to both systems according to exactly the same general laws (Einstein and Infeld, 1938: 201-206; Einstein, 1916: 15).¹⁴

Another example of the ready inter-translatability of systems of coordinates relates to the velocity of a moving object. If a train, travelling at 100 miles per hour, has aboard it a gunman who fires a gun, in the direction of travel, which releases a bullet moving at 500 miles per hour then, from the perspective of the other passengers, the bullet is moving at 500 miles per hour. From the perspective of a keen-eyed (stationary) observer on the embankment, however, it is moving at 600 miles per hour (Einstein, 1916: 18-19).

It does indeed seem very natural to think along the lines of the previous two paragraphs. However, in deriving a system of equations by which to describe the electromagnetic field,

¹⁴ In discussing relativity theory, I will, in keeping with Einstein's practice, generally use the expressions "*coordinate systems*" or "*systems of coordinates*", though the "frame of reference" terminology adopted in chapter 4 could be equivalently applied.

James Clerk Maxwell was to introduce a complication. Maxwell's equations predict that the velocity of light (strictly, the velocity of light *in vacuo*) is always the same in all coordinate systems, irrespective of whether the source of the light is moving in relation to one or other of those systems. Put differently, the velocity of light does not depend on the velocity of the emitting source. Hence, if we substitute for the gun in the train a torch emitting a beam of light, the velocity of the beam of light will be exactly the same from the perspective of the passengers on the train as it is from the perspective of the observer on the embankment (Einstein, 1916: 20-22).

We have noted above that the laws of nature would be expected to remain the same (to be “invariant”) when we pass from one observer's system of coordinates to another – something we are naturally keen to ensure. But we now face a problem. Employing the intuitive (so-called “classical”) transformation between coordinate systems which we have implicitly adopted above, we would have no reason to treat the velocity of the beam of light any differently than the velocity of the bullet. Accordingly, we would take it that, just as is the case with the bullet, the velocity of the beam of light would, from the perspective of the observer on the embankment, be travelling faster (by an amount equal to the velocity of the train) than it is for the passengers. Maxwell's equations, however, tell us that this is not what would transpire – the velocity of the beam of light in fact being exactly the same for the observer as it is for the passengers. Indeed, Maxwell's equations also tell us that our intuitive transformation of 500 miles per hour into 600 miles per hour as regards the bullet is, in fact, only *approximately* correct. Hence, if we are to accommodate such laws of nature as are expressed in Maxwell's equations (i.e., if we are to be able to pass from one system of coordinates to another whilst holding these laws of nature invariant), it would seem that we are going to have to abandon the classical transformation methodology which we have employed thus far.

Fortunately, a solution to this problem can be found in the deployment, in place of the classical transformation, of the so-called “*Lorentz transformation*” (named after Hendrik Lorentz). Without going into all of the complexities, it is worthwhile to note that the equations of classical transformation, and of Lorentz transformation, would come out the same were the velocity of light infinite – which, as Lorentz recognises, it isn't. Crucially, the general laws of nature (including those spawned by the Maxwell equations) are *invariant with respect to Lorentz transformations* (Einstein, 1916: 151).¹⁵

¹⁵ Strictly speaking, the Lorentz transformation is only applicable to *inertial* coordinate systems. In this context, Einstein tells us that the fundamental law of classical mechanics is the *law of inertia*, in accordance with which: “A body removed sufficiently far from other bodies continues in a state of rest

The prediction of the Maxwell equations that the velocity of propagation of light does not depend on the motion of the emitting source has other, and far-reaching, consequences. One is that, if the velocity of light (measured in, say, metres per second) is necessarily the same across two coordinate systems, then it must be the case that metres, and seconds, need *not* be the same across those systems. Indeed, it follows that a one metre measuring rod, held horizontally pointing in the direction of travel by a passenger on the train, will appear shorter than one metre to the observer on the embankment – the amount by which it appears shorter increasing as the velocity of the train increases. Furthermore, if they were exceptionally keen-eyed, our observer on the embankment would see that the wristwatches of the passengers on the train are going more slowly than is theirs. The passenger's "seconds", as it were, are longer than the observer's "seconds", at least as far as the observer is concerned, such that the passage of time on the train is, from the observer's perspective, slowed down (and, again, the more so, the faster the train is moving). And this cuts both ways: the passengers would find a measuring rod held by the observer to be "short", and the observer's watch to be running slow since, as far as the passengers are concerned, it is the observer who is moving, not them.¹⁶ The Lorentz transformation serves to capture these discrepancies and, indeed, the amount of the shortening of the rod, and of the lengthening of the seconds, can be calculated directly from the system of equations comprising the Lorentz transformation. More generally, if we know the place and time of an event (say, the landing of the stone dropped from the tower) in terms of the four coordinates pertaining to one system of coordinates (intuitively, one coordinate for each of the three spatial dimensions, and one for the time dimension), then the Lorentz transformation allows us to calculate the magnitude of the equivalent coordinates as they are relative to another coordinate system. In making this calculation, the Lorentz transformation has to abandon the unspoken assumption of the classical transformation that times, and temporal intervals, are common across all such systems. As indicated above, the calculation will also yield the same velocity of light in both systems, thereby holding this, and all other, laws of nature invariant across the two systems of coordinates (Einstein, 1916: 32-39, 119, 121, 151; Einstein and Infeld, 1938: 169, 171, 177-193, 213).

or of uniform motion in a straight line" (Einstein, 1916: 12). An *inertial coordinate system* is then a coordinate system in which the laws of mechanics, including the law of inertia, are valid. On this basis, the Lorentz transformation resolves inertial coordinate system which are in relative uniform rectilinear non-rotary motion relative to one another (Einstein, 1916: 63; Einstein and Infeld, 1938: 152, 158). The subject of non-inertial systems in non-uniform motion is considered in section 5.5 and, in particular, in section 5.9.

¹⁶ In principle, this is no different to what was said in section 4.1, where it was noted that whether or not the sun, or the earth, is in motion is something to be determined on a frame-relative basis.

5.2 The special theory of relativity and time

It has been seen in the previous paragraph that the Lorentz transformation, in reflecting the notion that the velocity of propagation of light does not depend on the motion of the emitting source, abandons the unspoken assumption of the classical transformation (indeed, the very natural assumption) that times, and temporal intervals, are common across all systems of coordinates. This is equivalent to saying that, from the point of view of relativity theory, time as well as space is changed by passing from one coordinate system to another. In other words, not just the spatial coordinates, but also the time coordinate, will be different as between two coordinate systems – and, crucially, as between two coordinate systems neither of which is rightly to be privileged over the other. Now, if the time coordinates can differ as between equally-justified coordinate systems, then whether or not two events are, for example, simultaneous or not, can also differ as between those coordinate systems. In other words, whilst two spatially separate events might be simultaneous in one system of coordinates, in another, they might not be. This can also be expressed by saying that, from the point of view of relativity theory, there is *no such relation as absolute simultaneity at a distance*. The relation of simultaneity, this is to say, cannot be said to hold between two events absolutely but, instead, holds only relative to a particular inertial system of coordinates. Simultaneity, therefore, is a *relative* notion (Einstein, 1916: 150-152; Einstein and Infeld, 1938: 178-179, 185, 207-208). And, crucially for current purposes, if there is no relation of absolute simultaneity, then it follows that there is no A-determination of absolute presentness, either, because, if there were such an A-determination as absolute presentness, then whichever objects exhibited it would be absolutely simultaneous with one another (Markosian, 2004: 74). Further, saying that there is no A-determination of (absolute) presentness amounts, of course, to saying that there are no A-determinations of (absolute) futurity or pastness, either. In consequence, any objective, universal sense of an event's being future, or present, or past, or of by how much an event is future or past, is lost. And what is lost along with it is any sense of objective, universal, absolute Change.¹⁷

This sense in which the special theory of relativity appears to exclude objective, universal, absolute Change has been elaborated upon by Hilary Putnam, who makes two main arguments to this effect. His first argument is that, on the basis of the special theory of

¹⁷ This is not to say, however, that the relativistic world is a world of disjointed chaos. Though temporal intervals are not invariant across all observers, *spatiotemporal* intervals are (see also section 5.4). Moreover, the light cones devised by Hermann Minkowski (see footnote 20 to this section) can show us those events which are determinately *past*, or *future* (albeit only relative to a particular observer).

relativity, some future events are just as real as present events, an argument which he notes can be extended to all future events and also to past events (Putnam, 1967: 240-243, 246). The second is that some events might be past without ever having been present (Putnam, 1967: 243-246). I will now examine Putnam's arguments.

In making his first argument, Putnam takes the case of two observers. Both would think of themselves as "*I-now*" – an instantaneous characterisation which refers to something different each time that it is deployed. Let us think of the two of them as "*I-now*" and "*you-now*", and let us say that the two are at the same place now, but moving with very high relative velocities.

This scenario, Putnam claims, directs us to the conclusion that future events are real. To appreciate why this is so, he invites us to start from a commonsensical viewpoint, whereby it might be thought that all (and only) things which exist *now* are real. "*Now*" we can think of as simultaneous with the appropriate instance of "*I-now*" or "*you-now*". As, according to the special theory of relativity, simultaneity is, as we have seen, to be construed relative to a particular coordinate system, we could then say that it is all (and only) those things that stand to "*I-now*" in the relation of simultaneity in "*I-now's*" coordinate system that are real. Similarly, those things that stand to "*you-now*" in the relation of simultaneity in "*you-now's*" coordinate system are also real. Now, one of the things which is real for "*I-now*" is "*you-now*", since "*I-now*" and "*you-now*" are simultaneous-at-a-point (they are both "*now*" and "*here*"), and hence they are simultaneous in all coordinate systems. Likewise, "*I-now*" is real for "*you-now*". Bear in mind, though, that, from the relativity of simultaneity, it follows straightforwardly that, for example, some events which lie in the present according to "*you-now's*" coordinate system lie in the *future* according to "*I-now's*" coordinate system. But these "future" events, being real for *you-now*, and given that "*you-now*" is real for "*I-now*", would seem to stand in a relation to "*I-now*" such that "*I-now*" should also regard them as real. To claim otherwise – to deny that the relation is transitive in this way – would be, contrary to the special theory of relativity, to privilege "*I-now's*" coordinate system over that of "*you-now*". If we are to retain the notion that there is no privileged observer (as the special theory says we must), then we have to accept that future things are real. Accordingly, we have to amend the commonsensical viewpoint that only things that exist now are real (Putnam, 1967: 240-243). The sense in which this conclusion will undermine the notion of objective, absolute Change, in particular for those A-theorists who are presentists (see section 2.2), will be developed in section 5.3.

Putnam arrives at his second argument via a discussion of the truth value of contingent statements about future events. For Aristotle, such statements famously had no truth values

(they were neither true nor false) (Aristotle: 19a23-19a38)¹⁸. But Aristotle had in play notions of absolute simultaneity (and absolute pastness, and absolute futurity), notions which the special theory has overturned. The situation does seem different if we consider, say, a space-fight which is in the future in my coordinate system but in the past in yours. Aristotle would presumably have to say that the disjunction “the A’s will win or have already won the space-fight” has no truth value for me, but that it does for you. But we cannot both be right regarding whether or not the disjunction has a truth value. And nor can just one of us be right, without becoming a privileged observer (Putnam, 1967: 243-244).

Most relevant for current purposes, Putnam goes on to consider events and, indeed, a person (Oscar) whose whole world-line is outside of the light cone of “*I-now*”.^{19, 20} Oscar can, nevertheless be in the past light cone of “*I-future*”, a future “stage” of “me”. When that future becomes the present, it can be said truly that Oscar existed – that he is past. But it will never be true to say that he “exists now” – that he is present. Thus, as Putnam puts it, “[t]hings could come to *have been*, without its ever having been true that they *are*!” (Putnam, 1967: 246). A key precept of the objective, absolute Change as it is presented in the A-theory, whereby what is past was once present, is therefore undermined (Putnam, 1967: 246).

¹⁸ This is a reference to Aristotle’s *De Interpretatione* using the pagination of Immanuel Bekker’s edition of the Greek text of Aristotle, first published in 1831.

¹⁹ The “world-line” of an entity consists in the succession of spacetime points which the entity occupies over the course of its history – in effect, the path that the entity traces in spacetime.

²⁰ “Light cones” are Minkowski’s method of visually representing spacetime from the perspective of a particular observer. For each observer, reality can be divided into one’s “past light cone”, one’s “future light cone” (together forming one’s (overall) light cone), and one’s “absolute elsewhere”. What is within the light cone is limited by the finiteness of the speed of light, the thought being that we cannot be affected by, and nor can we affect, anything which would require an interaction involving speeds greater than that of light (such speeds, according to relativity theory, being unattainable). Thus, the surface of an observer’s past light cone represents the paths of beams of light arriving (at, of course, the speed of light) at their location. Inside the past light cone are represented those slower-than-light events which are also capable of affecting the observer. The surface of the *future* light cone represents the spatial distance of future events which the observer could affect by sending out a signal at the speed of light, whereas inside it are represented those events which the observer could affect with slower-than-light signals. Events within the (overall) light cone are said to be “time-like separated” from the observer. Events outside the light cone are said to be “space-like separated” from the observer (Bardon, 2013: 70-72).

It can be seen, therefore, that Einstein's findings, as expressed in the special theory of relativity, do seem to rule out any notion of objective, absolute Change and, accordingly, tell against the A-theory. Indeed, it is possible to detect in Einstein's writings a broadly B-theoretic characterisation of time. For example, as he famously (and consistently with the B-theory) wrote to Anna Besso, the widow of his friend Michele Besso, shortly after Michele's death:

"Now he has departed from this strange world a little ahead of me. That means nothing. People like us, who believe in physics, know that the distinction between past, present and future is only a stubbornly persistent illusion" (Einstein, 1955: §215).²¹

Part 2 – Arguments that relativity theory is consistent with A-theoretic Change

5.3 Is the A-theory compatible with the special theory of relativity?

It has been seen, then, that the special theory of relativity presents substantial problems for the A-theorist, in particular by seemingly ruling out the notion of absolute simultaneity and, in consequence, the notion of absolute presentness. These problems appear most starkly, perhaps, in the case of those A-theorists who are presentists. As noted in section 2.2, presentists hold the view that only present things exist, or are real (i.e., they share the commonsensical view expressed in Putnam's first argument in section 5.2). Accordingly, rather than construing Change in terms of events moving in time from future through to past, presentists identify Change with the continuous churn of those events which are fleetingly present and which are, therefore, on their account, fleetingly real. However, in terms of the special theory, we have already seen that the conclusion of Putnam's first argument is that some future events are just as real as present events (see section 5.2). More generally expressed, according to the special theory, whether or not events are present events is a relative matter that can vary from one system of coordinates to another. And, if what is present is a relative matter, then, in terms of the presentist thesis, then so is what exists. Moreover, since the continuous churn of those events which are fleetingly present must also now be a relative consideration, the presentist notion of objective, absolute Change is threatened. A similar problem arises for Growing Block A-theorists (see section 2.2), since the coming into being of new (and previously non-existent) present events is, in terms of the special theory, a relative matter.

²¹ See also the comparable Kurt Vonnegut quote in section 2.3.

However, not all A-theorists are prepared to accept that the special theory does threaten their accounts in the way which it appears to do. Accordingly, I will now examine arguments given by Howard Stein, and by Mark Hinchliff, which seek to reconcile the special theory with the A-theory (with, in particular, the Growing Block A-theory, and with presentism, respectively). I will then, in section 5.5, go on to investigate whether the *general* theory of relativity might also be appealed to by the A-theorist in an attempt to secure their accounts. As will be seen, I will suggest that A-theoretic accounts of time are not, in fact, compatible with the special theory of relativity, and nor is support for them to be derived from the general theory.

5.4 Attempts to conform the A-theory with the special theory of relativity

It has been seen in section 5.2 that Putnam claims that a consequence of the special theory of relativity is that: “[t]hings could come to *have been*, without its ever having been true that they *are!*” (Putnam, 1967: 246). This was said to undermine a key precept of the objective, absolute Change as it is presented in the A-theory, whereby what is past was once present. It is suggested by Stein, however, that Putnam’s claim is only problematic if it is viewed through the pre-relativistic prism of classical physics. Putnam’s challenge to the A-theory, this is to say, is persuasive if, as does Putnam, one claims that by what is “real” is meant that which “exists *now*”, and if these terms are construed, as they are in classical physics, as being “... *objective... [and] relativistically invariant*” (Stein, 1968: 18; *cf.* Putnam, 1967: 240). But Stein’s contention is that, in a world which is relativistic, this is not the way to look at things. Rather:

“... in Einstein-Minkowski space-time *an event’s present is constituted by itself alone*. In this theory, therefore, the present tense can *never* be applied correctly to “foreign” objects” (Stein, 1968: 15).

Stein is here suggesting that, in a world which is relativistic, what is “present” is to be assessed in terms of what can be characterised as “*here-now*” – an event (indeed, a spacetime point) being present relative to itself (to its own “*here-now*”), but to nothing else. It, and it alone, is present. And the same is the case for every other event, or spacetime point, too. On which basis – on the basis of its relativising what is present to individual spacetime points – we should conclude, Stein claims, that the special theory of relativity “... *implies a particularly extreme (but pluralistic!) form of solipsism*” (Stein, 1968: 18). We are all objectively present, but we are all alone since, strictly speaking, nothing and no one shares our present (Dainton, 2010: 336).

Stein then extends this extreme pluralistic solipsism to the notion of what is real – what is real, on Stein's account, being relativised, just as is what is present, to individual spacetime points. But this is not to say that, on Stein's account, everything which is real is also present (as was claimed by Putnam). Rather, what is real with reference to a particular spacetime point (x) is, in Stein's terminology, what has "*already become*", or what is "*already definite*" (Stein, 1991: 148). This is to be understood in the terms that what is real with reference to x is x itself, together with that which lies in x 's causal past – i.e., the points on, or in, x 's past light cone. Anything else – i.e., those points which are on, or in, x 's future light cone, together with everything in its "absolute elsewhere" – is *not* real with reference to x (see footnote 20 to section 5.2 on light cones and "absolute elsewhere") (Stein, 1991: 148-149, 152, 165; Bourne, 2006: 164; Dainton, 2010: 332-334).

Stein's conclusion is then that, *contra* Putnam, relativity theory does not force us to reject the A-theory. Rather, it simply shows that, in a relativistic world, the A-theorist can no longer, as they would standardly have done, seek to align their posited objective Change with notions of absolute simultaneity. Instead, the A-theorist must follow Einstein in abandoning the "*absolute character of simultaneity*" and accept that Change is something which is rightly to be thought of as being relativised to a multitude of (objective) frames of reference – one such frame of reference for each spacetime point (Einstein, 1916: 150). It might be noted, too, that, in his characterisation of what is real in terms of "becoming", Stein would, in particular, seem to be sympathetic to the Growing Block version of the A-theory (Dainton, 2010: 335). I will consider shortly whether Stein's account does, indeed, succeed in accommodating the Growing Block A-theory within a relativistic setting. First, however, I will set out another account which, like Stein's, accepts the abandonment of the absolute character of simultaneity and seeks to accommodate objective Change within the special theory by asserting that what is present, and what is real, are matters to be adjudged relative to each of the multiplicity of individual spacetime points. This account is provided by Hinchliff who, in contrast to Stein, provides a relativised version, not of the Growing Block A-theory, but of presentism.

Hinchliff begins his account by noting that Putnam, in his first argument in section 5.2, can be said to be suggesting that, for the presentist in a relativistic world, those events which are real are those events which are simultaneous with "*us-now*" in our system of coordinates. But this, claims Hinchliff, is not the only way in which presentism and the special theory might be sought to be reconciled. Among other alternatives, Hinchliff suggests, is what he terms the "*cone model*" (Hinchliff, 2000: S576). According to the cone model, a view Hinchliff attributes to the "*cone presentist*" (Hinchliff, 2000: S581), the present for an event E is to be identified with the surface of E 's past light cone (this approach, as Hinchliff notes, follows a related proposal by

William Godfrey-Smith (Godfrey-Smith, 1979: 240-244)). This characterisation serves to capture, Hinchliff claims, the idea that what is *present* is what one is observing *now* (both terms being repositioned within a relativistic setting, as will be expanded upon below). As Hinchliff notes, it is also the case that, unlike with Stein's account, with cone presentism we are no longer alone, since our present is shared with everyone and everything on the surface of our past light cone (Hinchliff, 2000: S578-S580; Dainton, 2010: 336).

An objection to Hinchliff's cone presentism stems from the obvious question as to why events on the surface of *E*'s past light cone should be regarded as part of *E*'s present when, given that the speed of light is not infinite, they would, in fact, seem to be earlier than *E*. Steve Savitt expresses this objection in terms of "*achronality*" (Savitt, 2000: S567). The principle of achronality reflects the view that, if something is in *E*'s present, then it should not be in *E*'s absolute past – "absolute" here in the sense that all observers (in all inertial frames) would agree that it lies in *E*'s past. Since all observers *will* agree that events on the surface of *E*'s past light cone lie in its past, then, since cone presentism treats such events as present, cone presentism would appear to violate the principle of achronality (Hinchliff, 2000: S582).²²

Hinchliff, however, does not deny that cone presentism violates the principle of achronality. But this violation, he argues, is not to the detriment of cone presentism. It was seen in section 5.1 that the Lorentz transformation abandons the unspoken assumption of the classical transformation that temporal intervals are invariant across all systems of coordinates. The principle of achronality, however, presupposes this invariance of temporal intervals. In consequence, claims Hinchliff, the principle of achronality cannot be properly deployed in a relativistic setting. What is invariant in a relativistic setting, rather than temporal intervals, is *spatiotemporal* intervals. And, whilst those events on the surface of *E*'s past light cone are not at a temporal interval of zero from *E*, they are at a spatiotemporal interval of zero from *E*. Indeed, this is the basis on which, reflecting relativism, Hinchliff has adjudged that the present for event *E* is to be identified with the surface of its past light cone (Hinchliff, 2000: S582-S583). A virtue of cone presentism then becomes that it defines the present in terms of an invariant feature of the special theory (Hinchliff, 2000: S580).

Hinchliff's claims in the previous paragraph are, I suggest, persuasive. They do, however, lead into a further objection from Savitt (Savitt, 2000: S566-S567). The cone presentist, we have just seen, is relying on the idea that events on the surface of the past light cone of *E*

²² An equivalent argument can also be made in terms of the principle of achronality that an event in *E*'s present should not be in *E*'s absolute future.

have a spatiotemporal interval from E of zero. Another way to put this is to say that events on the surface of the past light cone of E have a “light-like” separation from E . However, this is also the case for events on the surface of the *future* light cone of E . Accordingly, shouldn't the cone presentist be including events on E 's future light cone within what is present for E , too? To not do so appears merely arbitrary. But, to do so would mean that a single event can be present twice, an event on the surface of E 's future light cone becoming present again when it is on the surface of E 's past light cone (Hinchliff, 2000: S581-S582).

Hinchliff, however, rejects this argument, and I think he is justified in so doing. The distinction between events on E 's past and future light cones is not, as Savitt suggests, merely arbitrary. This is because, as noted in section 5.2 (footnote 20), the surface of E 's past light cone is the set of events *from* which a light signal could be sent *to* E (and can be thought of in terms of the set of events which can affect E). The surface of E 's future light cone, however, is the set of events *to* which a light signal could be sent *from* E (and can be thought of in terms of the set of events which E can affect). Hence, Hinchliff's different treatment of the past and future light cones, rather than being arbitrary, in fact properly reflects the asymmetric nature of causation (Hinchliff, 2000: 582).

A final objection which Savitt raises concerns the point mentioned above to the effect that, in terms of cone presentism, what is present is what one is observing *now*. But, as Savitt asks, would we really want to think, say, that the cosmic microwave background radiation being observed by contemporary astrophysicists should count as part of their present given that it originated 15 billion years ago (Savitt, 2000: S566)?

As Hinchliff agrees, this objection does seem instinctively persuasive. However, on reflection, it can be seen that it does not succeed against cone presentism. According to the special theory, there is no fact of the matter concerning when the radiation originated, whether 15 billion years ago or otherwise, since there is no privileged system of coordinates from which to determine this. Relatedly, no claim is being made by the cone presentist to the effect that the origination of the radiation is “simultaneous” with the astrophysicists' observation. In a pre-relativistic setting, presentism would have been put in such terms. But, in a relativistic setting, in which simultaneity is relative but in which spatiotemporal intervals are invariant, the cone presentist's claim is that the origination of the radiation is at a spatiotemporal interval of zero from the observation. And this remains the case, even across seemingly vast temporal disjuncts such as 15 billion years (Hinchliff, 2000: S581).

Overall, therefore, I consider that Hinchliff makes a successful defence of cone presentism on its own terms – though I will say more about his account more generally shortly. First, however, to return to whether Stein’s account succeeds in accommodating the Growing Block A-theory within a relativistic setting, I will now suggest that it does not. Whilst I have characterised Change as it is depicted by the A-theorist as Change which is, not just objective, but Change which is also *absolute*, I do not propose to challenge Stein’s account merely on the specific ground that the Change which it posits, whilst objective, is *relative*. Rather, my concern is that Stein’s argument does not, in fact, serve to motivate an A-theoretic account of time in preference to a B-theoretic account of time. Central to this concern is the point that, as Craig Bourne notes:

“[Stein’s account]... essentially amounts to treating ‘present’ as an indexical and nothing more” (Bourne, 2006: 166).

Indeed, in being relativised to each individual spacetime point, “present” could hardly be any more indexical nor, with reference to section 2.2, any less “special”. And such a characterisation of the present aligns, I suggest, much more closely with B-theoretic thinking than with A-theoretic thinking. As Bourne puts it, Stein’s account, in promoting such a profligate notion of an objective present, “... *rejects tense as traditionally understood*”, falling short of “... *[allowing] us to express any kind of substantial thesis concerning tense*” and failing to secure any notion of “*tense proper*” (Bourne, 2006: 185, 165, 166, respectively). As such, whilst Stein’s account might resonate with certain aspects of the Growing Block A-theory, as a whole it is so divorced from any standard presentation of the A-theory as to lack any meaningful family resemblance to it. As such, there would seem to be nothing in Stein’s characterisation of tense to motivate an A-theoretic account over a B-theoretic account.

To return to Hinchliff’s cone presentism, I have said above that I consider Hinchliff to make a successful defence of cone presentism on its own terms. However, in its relativising what is present (and what is real) to each and every event, Hinchliff’s account does seem vulnerable to the type of objection just made with regard to Stein to the effect that cone presentism is failing to remain true to the spirit of the A-theory. Moreover, as has been seen, cone presentism is replacing the idea from presentism, as standardly presented, that temporal intervals are invariant with the idea that the invariant features are now spatiotemporal intervals. Presentism is thus now to be understood as a view, not about time, but about spacetime.²³ This shift we should allow, Hinchliff contends, in the same way that we happily extend

²³ A fuller consideration of Einsteinian spacetime is set out in Part 3 of this chapter.

equivalent “... *latitude and tolerance*” in making the transition from classical to relativistic physics (Hinchliff, 2000: S583).

I am not so sure, however, that such latitude and tolerance is appropriate. As Putnam notes, it is not a criticism of Newton that he failed to foresee Einsteinian relativity (Putnam, 1967: 245). But this does not mean that we can simply reposition Newtonian physics in a relativistic setting whilst claiming that it is still “Newtonian physics”. Presentism, as traditionally understood, appeals to absolute simultaneity. And, if we did feel inclined to try to reposition presentism in a relativistic setting, I suggest that, in forgoing absolute simultaneity, we are at least obliged to retain the feature of transitivity in characterising the notion of the present – at least, if what we want to arrive at is to have a sufficient resemblance to (non-relativistic) presentism. Cone presentism, however, denies transitivity (Hinchliff, 2000: S583-S584). An event *X*, inside an observer’s past light cone and hence time-like separated from the observer, can send a signal to event *Y* which is on the surface of the observer’s past light cone and hence light-like separated from the observer. According to cone presentism, *X* is therefore present for *Y*, and *Y* is present for the observer, but *X* is not present for the observer. Rather, according to cone presentism, *X* is “past” for the observer. And, in sacrificing transitivity and simply switching from invariant temporal intervals to invariant spatiotemporal intervals, I find, *contra* Hinchliff, that the cone presentist is not being “... *true to his school*” (Hinchliff, 2000: S583). Accordingly, cone presentism, whilst engaging and coherent on its own terms, does not provide a means of reconciling the A-theory with the special theory of relativity. As could equally be said of Stein, in accepting the abandonment of the absolute character of simultaneity (a character ordinarily supposed to be at the heart of the A-theory), Hinchliff simply faces too great a task in attempting to press home an A-theoretic account of time. Of course, the mere fact that the accounts provided by Stein and Hinchliff are not, in my view, properly to be called “A-theories” need not mean that their approach to relativising Change is unsuccessful in and of itself (it might just mean that they have mis-classified their accounts). However, as suggested in section 4.3, this thesis will defend the claim that, in opposition to Stein’s and Hinchliff’s approach, the question of the relativisation of Change is best considered in the context of what I have called the subjective temporal frame of reference. (An argument which, in contrast to Stein and Hinchliff, seeks, to the benefit of the A-theorist, to *reinstate* the absolute character of simultaneity is examined in section 5.10. As will be seen, this argument, it is suggested, is unsuccessful.)

5.5 The general theory of relativity

Thus far, then, it is proving difficult to conclude that relativity theory is compatible with Change as it is presented in the A-theory. However, a further argument might be brought based upon a further analysis of Einstein's thesis. This is because the analysis above has not gone beyond Einstein's *special* theory of relativity – a theory which considers only the case of inertial coordinate systems moving uniformly relative to one another (section 5.1 (footnote 15)), and which applies to a universe which lacks a gravitational field. Einstein, however, was to extend his theory to include all coordinate systems, not just those moving uniformly in relation to one another, but also those moving arbitrarily, and to allow for all laws of nature, including those pertaining to the gravitational field. This Einstein did in his *general* theory of relativity.²⁴

Why, though, might it be thought that the general theory could serve to reinstate the idea of objective, absolute Change, which the special theory has seemed to refute? The reason is that the analysis as regards the special theory partly relied on the notion that no particular system of coordinates should be privileged over any other. Hence, since time, in consequence, is relativised to each of a multiplicity of equally-justified coordinate systems, the idea of an objective, or even a privileged, viewpoint as regards time fell away. However, against this it might be claimed that, whilst with special relativity no one system of coordinates, or world-line through spacetime, spawns a more correct perspective on time than does any other, things are different in a matter-filled, general-relativistic universe (as noted in section 5.2 (footnote 19), the “world-line” of an entity consists in the succession of spacetime points which the entity occupies over the course of its history – in effect, the path that the entity traces in spacetime). Perhaps the general theory, this is to say, points us towards what might be regarded as a *distinguished* world-line. For example, this could be said to comprise some sort of averaging-out of the world-lines travelled by the major mass points of the universe, such as the stars, and the galaxies. It would then become natural to relativise time to that distinguished world-line, thereby recovering the concept of an objective, cosmic time, and of objective simultaneity (Malament, 1995: 262; Gödel, 1949(a): 204).

In my view, however, any contention to this effect would be unjustified. One argument against it is that this notion of cosmic time is not, after all, *objective*: rather than picking out a world-line which is objectively first among equals, it simply derives it from certain world-lines which

²⁴ We saw in section 5.1 that the special theory makes use of the Lorentz transformation. In contrast, given the introduction of coordinate systems in non-uniform relative motion, the general theory requires the deployment of Gaussian coordinates. Gaussian coordinates are further discussed in section 5.9.

are arbitrarily privileged over others. Moreover, the calculations of the mean motion of matter which underpin it, unless they (arbitrarily) involve stipulations such as the size of the stars, galaxies, etc. to be included in the calculations, are inevitably approximate. It might also be argued, as Kurt Gödel argues, that it offers a highly contingent notion of cosmic time, one which is down, not to the laws of nature, but to the contingent distribution and motion of matter. As such, its conclusions, I suggest, lack metaphysical robustness (Gödel, 1949(b): 274; 1946/1949(b): 237-238; 1946/1949(c): 253; 1949(a): 204 (fn. 9), 205-207).

Indeed, more powerfully still, Gödel came to recognise that it need not be the case that the world-lines of the major mass points of a general-relativistic universe do, in any case, suggest a “natural” notion of cosmic time. This is because any such notion presupposes the *non-rotation* of those major mass points. Why so? Well, the standard way to look at simultaneity is to say that objective simultaneity (which objective cosmic time would presuppose) obtains when a congruence of world-lines is intersected by a spatial slice (strictly, a three-dimensional space-like hyperplane – see also section 5.10), and where that slice is everywhere orthogonal to each of the individual world-lines within the congruence. And, crucially, the “everywhere orthogonal” condition can only be met if the major mass points whose world-lines are at issue are not rotating, such that their world-lines are “twist-free”, rather than helical. Think of a three- (rather than a four) dimensional analogue (from Malament, 1995: 263). It is impossible to cut (or “slice”) a rope, made up of many intertwined strands, such that the surface of the cut is orthogonal to each strand. But, if the rope is untwisted, such that all of the strands lie parallel to one another, then it *is* possible. In like fashion, in four dimensions, a spatial slice can only be orthogonal to a congruence of major mass point world-lines if those world-lines are “twist-free” – i.e., if the universe is not rotating. Gödel thus set out to find – and *did* find – cosmological solutions of Einstein’s general-relativistic field equations based upon rotating universes – universes which refute, even in a general-relativistic context, the notion of objective simultaneity, and of an objective, cosmic time (Gödel, 1949(b): 274-275; 1949(c): 190-198; Malament, 1995: 261, 263). Moreover, such rotating universes are consistent with our own universe in terms of, for example, exhibiting red-shift for distant objects (provided, at least, that our universe is expanding) (Gödel, 1949(b): 274, 283, 284; 1949(c): 197-198; 1949(a): 206; 1952: 208-216). Accordingly, support for the notion of a relation of absolute simultaneity is not, I suggest, to be found in the general theory of relativity any more than has been said to be the case in the special theory. In consequence, the notion of objective, absolute Change as it is presented in the A-theory has not, I suggest, been restored.²⁵

²⁵ It might be wondered what is meant by the idea of a “rotating universe”. Rotating with respect to what, exactly? Not, of course, with respect to its all-encompassing self, since that would not be

That said, however, the analysis above has depended in part on the statement, made in the previous paragraph, that Gödel's rotating universes are consistent with our own universe – a statement which might usefully be subjected to further scrutiny. In this regard, Gödel was to conclude that rotating universes accommodate world-lines comprising what he terms “*closed time-like lines*” (e.g., Gödel, 1949(b): 274), more generally known as *closed time-like curves* (see footnote 19 to section 5.2 regarding world-lines). To travel along a closed time-like curve is to travel into the future from a local perspective but, taken as a whole (taken “globally”), it is to head towards the start-point, both temporally and, indeed, spatially speaking, from which one began. In other words, taken as a whole it is, temporally speaking, to travel into the past (Bourne, 2006: 211; Dainton, 2010: 382-383).

This notion of closed time-like curves might be thought, at first pass, to strengthen the claim that there is no objective simultaneity, or objective, cosmic time. After all, if each past event is going to come around again in the future, then any notion of a linear temporal ordering is demolished. However, the fact of closed time-like curves arising in the context of Gödel's rotating universes can also be used to bring into question whether Gödel universes are, as has been claimed, consistent with our own universe. This is because, in other cases where closed time-like curves have been found within solutions to Einstein's field equations, the universes so portrayed involve matter distributions which are relevantly different to the matter distribution that actually obtains in our universe. Moreover, closed time-like curves are compatible with the notion of time-travel – time-travel being something which might be thought to be ruled out in virtue of certain paradoxes which it arguably involves.²⁶ Might a claim be

relevantly different to its being stationary. In fact, we shouldn't try to think of a rotating universe in terms of there being some sort of central axis around which it stolidly and tirelessly turns. Rather, we should bear in mind that relativity theory posits a *local inertial field* which determines the motion of bodies upon which no forces act. In particular, this local inertial field determines the behaviour of, for example, a completely free gyroscope. And Gödel was able to show, contrary to the then generally-accepted Mach's principle, that it is possible to have solutions of Einstein's field equations in which matter is in motion relative to the spatial directions defined by such a completely free gyroscope – in motion, as Gödel puts it, relative to the “*compass of inertia*” (Gödel, 1949(b): 271). And the motion relative to the compass of inertia we can properly describe as *rotation*, and as rotation of the universe as a whole, since, analogously to the case of a rigid rotating body, Gödel's solutions show that the distance between any two material particles in the universe, as measured by the length of the geodesic perpendicular to their respective world-lines, remains constant at all times (Gödel, 1949(b): 271, 277-283; 1949(c): 196-198; Hawking, 1990: 189).

²⁶ For example, the “Grandfather Paradox” brought to prominence by David Lewis (Lewis, 1976: 145-152).

made, then, that Gödel universes are not, in fact, consistent with our own universe, such that the implications which Gödel universes have for the nature of time are not relevant to considerations of time as it is in our universe? Gödel's universes, it might be put, are, as he demonstrates, physically possible, but this is not to say that they are *metaphysically* possible (or "*possible in fact*" (Mellor, 1998: 127)). Hence, whilst universes might, consistently with the equations of general relativity, accommodate a conception of something superficially temporal which involves closed time-like curves and, in consequence, rules out any notion of objective, absolute Change, there are good metaphysical reasons for thinking that the actual universe does not and, indeed, could not, accommodate time so conceived (Dainton, 2010: 383-385; Mellor, 1998: 127).

In this regard, it might, indeed, seem obvious that Gödel's conception of "time", replete with its closed time-like curves, does not equate to our conception of time as involving a linear temporal ordering, such that we can swiftly jettison what Gödel calls "time", and Gödel universes more generally, from our metaphysics. In fact, however, this would be too hasty. This is because both we, and the inhabitants of a Gödel universe, experience time as linear since, from a local perspective, that is how time is, not just in our universe, but in Gödel's, too. From the local perspective, therefore, *time*, both for us, and for the inhabitants of a Gödel universe, refers to something which is locally linear. But what about the global perspective? Frankly, we just don't know. Global features of time, such as closed time-like curves, are not features of time with which we have, or ever could have, any acquaintance. It is thus an open question whether our understanding of *time* is an understanding of something which is *globally* linear or not. On this basis, Gödel universes, whilst containing time which is globally non-linear, might, nevertheless, be consistent with our conception of time. Accordingly, we cannot justify a claim that what Gödel is referring to as "time" does not equate to time as it is in our universe (Bourne, 2006: 217).

The comment above, that it is an open question whether our understanding of *time* is an understanding of something which is globally linear or not, amounts to our saying that it cannot be claimed that tense is an *essential* feature of time. This is seemingly unwelcome news for the A-theorist. However, might the A-theorist be able to accept (from above) that we cannot claim that what Gödel is referring to as "time" does not equate to time as it is in our universe, accept the consequence of this that tense is not an essential feature of time, but then seek to restore some notion of objective, absolute Change, at least in the actual universe, by claiming that, though it is not an essential feature, tense is, nevertheless, a *contingent* feature of a universe?

In fact, to press this claim would not much help the A-theorist. Tense, we might propose, might be contingent either on empirical grounds, or in consequence of brute metaphysical fact. But, regarding, first, empirical grounds, as Bourne notes, its being the case that a particular universe exhibits all of the empirical facts required to undergird the notion of tense is not an argument for the A-theory. This is because the same empirical facts are also consistent with the B-theory – and because, beyond the empirical facts with which both theories are consistent, there are no other empirical indicators which might push us A-wards rather than B-wards. And to claim that it is purely a *metaphysical* fact about a universe that it is tensed or tenseless would be highly speculative. For one thing, if physics has no role for tense, and if a universe would be the same, empirically speaking, with or without it, what motivation is there to assert that certain universes are tensed when others, such as Gödel's, are not? More particularly, to claim that it is purely a contingent metaphysical fact about a universe that it is tensed or tenseless provides no grounds for the A-theorist to assert that our actual universe just happens to be a tensed one (a related argument involving temporal phenomenology will be given in section 5.10). Furthermore, to claim, with regard to a particular universe, that it is just a matter of a brute metaphysical fact's obtaining or not obtaining whether that universe is, contingently, tensed or tenseless is to posit a metaphysics of a curiously arbitrary kind (not least as whether that universe contains, or does not contain, various other large-scale ontological features would presumably also be down to such metaphysical caprice) (Bourne, 2006: 218-223). Overall, therefore, the suggestion from section 5.4, and from earlier in this section, that relativity theory tells against the A-theory is, I believe, upheld.

Part 3 - Why relativity theory need not rule out metaphysically significant Change

5.6 The construction of Einsteinian spacetime

In Parts 1 and 2 of this chapter, I have argued that relativity theory undermines the notion of objective, absolute Change as it is presented in the A-theory. Given the weight rightly accorded to relativity theory, this might be thought detrimental to any account, such as the proposed account, which seeks to defend the notion of metaphysically significant Change. The purpose of this Part 3, therefore, is to demonstrate that relativity theory does not, in fact, undermine the proposed account's positing of Change which is metaphysically significant relative to a particular frame of reference.

To begin this argument, I will first expand upon what has been said in section 5.4 about Einsteinian spacetime – something which is generally characterised as a four-dimensional

continuum.²⁷ This characterisation of spacetime is arrived at by assuming, first, a structureless set of featureless entities which we can think of as “points”. This set of points Einstein assumes endowed with a topology so as to render it a manifold. A manifold, informally speaking, can be thought of as a space that is modelled on Euclidean space. More formally, a manifold is a topological space that locally resembles Euclidean space near each point. This is to say that each point of an n -dimensional manifold has a neighbourhood that is homeomorphic to the Euclidean space of dimension n . In terms of Einstein’s four-dimensional continuum, we are therefore constructing a topological space locally homeomorphic to Euclidean 4-space.

Having established a manifold in this way, each event in the world can then be assigned to a point of the manifold at which the event is said to occur. However, if these events are to represent the content of a spacetime rather than merely forming some random set of events, it is necessary to specify a metrical structure which will enable us to attribute spatial and temporal characteristics to the events – for example, those characteristics which are required if we are to know which events are earlier than, or later than, other events, or if we are to know the spatial or temporal distances between events. Having specified such a spatiotemporal metrical structure and applied it to the manifold of events, we have then (making due allowance for the simplified nature of this description) arrived at Einstein’s four-dimensional spacetime continuum.

One way to characterise this construction of spacetime is to say that what Einstein has done is to map the manifold of events by applying to it an architecture of spatiotemporal coordinates. Indeed, it has already been seen in section 5.1 that all of the events within spacetime can be contemplated from different viewpoints, or different perspectives, represented by different coordinate systems. The overall architecture of spatiotemporal coordinates can thus be thought of as housing a multiplicity of individual coordinate systems, each such system pertaining to a particular perspective situated at its point of origin. Further substance can then be brought to this characterisation by envisaging specific coordinates as being separated from other coordinates by intervals which can be thought of in terms of a certain number of

²⁷ Since the ideas of combining time with space, and of describing events as occupants of four-dimensional spacetime, were Minkowski’s (Minkowski, 1908), (special) relativistic spacetime is often referred to as “Minkowski spacetime”. However, as Einstein came to endorse Minkowski’s depiction, and to apply it in the general theory of relativity, I will, for consistency with the rest of the discussion, refer to it as Einsteinian spacetime (Einstein, 1916: 56-58).

measuring rods, or in terms of the number of ticks of a clock (Einstein, 1916: 98-99, 154²⁸). In this context, it was seen in section 5.1 that, in consequence of the finding that the velocity of propagation of light (strictly, *in vacuo*) does not depend on the motion of the emitting source, a measuring rod of, say, one metre in length, held horizontally and pointing in the direction of travel by a passenger on a train, will appear shorter than one metre to an observer on the embankment. Further, the wristwatches, or clocks, of the passengers on the train will appear to the observer to be going more slowly than is their own watch, the passengers' seconds appearing to the observer as longer than are their own seconds. A final aspect of the spatiotemporal metrical structure of spacetime is, therefore, that, in deploying the system of measuring rods and clocks, it is important to recognise that each individual coordinate system will have its own measuring rod, with its own clocks attached to it (Einstein, 1916: 20-58, 98-99, 154; Einstein and Infeld, 1938: 182, 199-208).

5.7 The intrinsic metrical amorphousness of continuous spacetime

The way in which spacetime has been depicted in section 5.6 – a way which includes a spatiotemporal metrical structure marked out in terms of measuring rods and clocks – does, I think, very much shape whatever understanding we might come to have of the manifold of events. The question that now arises, however, concerns the status that is to be accorded to this spatiotemporal metrical structure. In particular, the question to be addressed is whether the spatiotemporal metrical structure is to be thought of as an essential feature of relativity theory itself or, instead, as something which is introduced into the theory for, perhaps, clarificatory or elucidatory purposes. If the former – if the spatiotemporal metrical structure is an essential feature of relativity theory – it might then be concluded that the description of the structure provided within relativity theory is reflective of some underlying aspect of metaphysical reality. If the latter – if the structure is introduced for clarificatory or elucidatory purposes – then any claims that some underlying aspect of metaphysical reality is being described would be the weaker. To begin such an investigation, a useful place to start, I suggest, is with Adolf Grünbaum's discussion of what he calls "*intrinsic metrical amorphousness*" (Grünbaum, 1973: 498).

In getting to grips with what Grünbaum's calls intrinsic metrical amorphousness, some other terminology first needs clarifying. For example, Grünbaum speaks of *metric relations*. By this,

²⁸ Page references to Einstein (1916) from pages 139 to 158 refer to an appendix added by Einstein in 1952. Page x (cited in section 5.9) refers to a note added by Einstein at the same time.

he has in mind functions such as distance functions, measure functions, and length functions – the sort of functions which might (or might not) yield equality or, as he calls it, “*congruence*” (Grünbaum, 1973: 468). As such, Grünbaum’s metric relations can be seen to be consistent with the notion of what has been described above as a metrical structure. And, Grünbaum tells us, metric relations of this kind are sometimes *intrinsic* metric relations. To get an idea of what is meant by intrinsic, it can be said that, in the case of the natural numbers, the rational numbers, and the real numbers, certain metric relations which obtain (e.g., “*less than*”; “*greater than*”; “*betweenness*”) are, indeed, intrinsic (Grünbaum, 1973: 467). This is because, in each case, the relations are grounded in the familiar arithmetic features of the elements which constitute the various number lines (simply put, the lines comprise numbers which are inherently a different number than is any other number) (Grünbaum, 1973: 467, 499). The metric relations are thus intrinsic in the sense that they obtain without any appeal needing to be made to anything beyond what is provided by the domain itself (Grünbaum, 1973: 499; Massey, 1969: 339). As Hermann Weyl states, with reference to Bernhard Riemann, in the case of the number lines the notion of intrinsic means “... in itself, *a priori*, as a consequence of the concept of number”.²⁹ Riemann himself tends to use the word “*implicit*” in place of intrinsic, which also gives some substance to the notion.³⁰ The basic idea, then is that a metric relation is intrinsic to a domain if the fact of the equality (or inequality) of any intervals of the domain, in terms of the metric in question, does not call upon anything whose existence is not implied merely by the existence of the domain.

Grünbaum also introduces the idea of metric relations being “*trivial*” or “*nontrivial*” (Grünbaum, 1973: 476). If a metric relation is to be nontrivial, then the metric in question must be one which reveals something interesting with regard to the character of a given domain – one which succeeds in “... [*telling*] *specifiable parts of the spatial or temporal story*” (Grünbaum, 1973: 494-495). An example of a *trivial* metric (one which fails to tell an interesting story) would be a distance metric which unedifyingly assigns the same spatial separation to each and every pair of distinct points in a particular domain (Grünbaum, 1973: 526).

This is sufficient to get us to what Grünbaum means by the notion of intrinsic metrical amorphousness. What he means is that a domain can rightly be described as intrinsically metrically amorphous when every nontrivial metric on the domain lacks a rudimentary intrinsic

²⁹ From H. Weyl, 1950, *Space-Time-Matter* (New York: Dover Publications), cited at Grünbaum, 1973: 497.

³⁰ Translated from B. Riemann, 1953, *Gesammelte Mathematische Werke und Wissenschaftlicher Nachlass*, 2nd edition (ed. H. Weber) (New York: Dover Publications) at Grünbaum, 1973: 497.

basis – i.e., when answers to questions regarding the equality or inequality of intervals of the domain, in terms of every nontrivial metric on the domain, cannot be derived from the nature or character of the domain alone (Grünbaum, 1973: 526).

One domain which fits the description of being intrinsically metrically amorphous, Grünbaum tells us, is continuous physical space. As he expresses it: “... mathematically continuous physical space... has no intrinsic metric in the plain sense that its intervals have no *built-in* metric” (Grünbaum, 1968: 34). Alternatively put, the nontrivial metrics of continuous physical space are exclusively *extrinsic* (Grünbaum, 1973: 497, 498). Riemann, too, concludes that continuous physical space is intrinsically metrically amorphous (Grünbaum, 1973: 498). Riemann also makes the point, however, that *discrete* space, in contrast to continuous space, is endowed with an intrinsic metric (Grünbaum, 1973: 495). As Grünbaum quotes Riemann on both discrete and continuous domains:

“... while in a discrete [domain] the principle of metric relations is implicit in [i.e., is intrinsic to] the notion of this [domain], it must come from somewhere else in the case of a continuous [domain]. Either then the actual things forming the groundwork of a space must constitute a discrete [domain], or else the basis of metric relations must be sought for outside that actuality, in colligating forces that operate upon it...” (Grünbaum, 1973, 496).³¹

Riemann, then, is suggesting that, in general, discrete domains will not be intrinsically metrically amorphous, whilst continuous ones will be. And, indeed, the idea of a discrete/ intrinsic *versus* continuous/ extrinsic split does have some intuitive weight. The most obvious reason for such a split is that certain (intrinsic) metric relations within a discrete domain can be determined in terms of numbers of the constituent elements of the domain (e.g., two intervals on the domain are equal if they contain equal numbers of elements) – something which cannot be done with a continuous domain. As such, it is continuous domains which seem the more likely to be intrinsically metrically amorphous. That said, however, this should not be thought of as a hard and fast rule. Indeed, in this regard, we have already seen that the real number line – which is continuous – does possess rudimentary intrinsic metrics. What this suggests is that there is something else which needs to be taken into account, namely, whether the elements of a domain are homogenous or not. Within, say, the domain of continuous time, all instants, *qua* elements of time, are homogeneous. Equally, punctal

³¹ Quoting from B. Riemann, 1959, *On the Hypotheses Which Lie at the Foundations of Geometry* (in *A Source Book of Mathematics, Volume II* (ed. D.E. Smith) (New York: Dover Publications)).

events, *qua* elements of Einstein's continuous spacetime, are (metrically) homogeneous with one another. But the elements of the real number continuum, as was touched upon above, are not homogeneous, being relevantly different in terms of their familiar arithmetic features (i.e., in terms of their being different numbers from one another) (Grünbaum, 1973: 458-459). To drill down, then, it is those continuous domains which contain homogeneous elements (elements which are qualitatively alike) which, on Grünbaum's account, lack (nontrivial) intrinsic metrics. And these continuous domains include, in particular, continuous space, continuous time, and continuous spacetime – all of which, this is to say, are intrinsically metrically amorphous. Those domains that do have (nontrivial) intrinsic metrics are the discrete domains plus the continuous line of the real numbers (Grünbaum, 1973: 496, 498, 500, 512-545, 557-558; Massey, 1969: 333).

5.8 Measuring rods, clocks, and a physical interpretation of coordinate systems

It has been seen in section 5.7 that, in the case of the extended number lines, certain illuminating metric relations are intrinsic to the very notion of the lines in question. In contrast, Grünbaum has made the argument that continuous space, continuous time and continuous spacetime are intrinsically metrically amorphous. In terms of Grünbaum's account, this is to say, facts about the congruence (equality) of intervals within continuous space, continuous time, and continuous spacetime (such as Einsteinian spacetime), are not purely spatial and/or temporal facts but, instead, concern the relations between the domain in question and certain extraneous physical standards. For example, the property of being one metre long is not intrinsic to any part of continuous space since an interval can only have this property in virtue of the existence of a non-spatial physical standard such as the now-familiar measuring rod (Horwich, 1975: 199, 204). Equivalently, two temporal intervals in continuous time are equal or unequal, not on any intrinsic basis, but only in terms of the ticking of an imported clock. It then follows from this that the spatiotemporal metrical structure which Einstein applies to the manifold of events – a spatiotemporal metrical structure which epitomises equality/inequality considerations in terms of measuring rods and clocks – is not a product of relativity theory itself but is, instead, something extrinsic to relativity theory which is introduced from outside of that theory. I will claim in this section that Einstein would agree with Grünbaum in this regard.

First, however, I want to deal with something which might be thought to suggest that Einsteinian spacetime is not, as Grünbaum is claiming, intrinsically metrically amorphous after all. This thought arises because, as we have seen, Einstein applies to the manifold of events

an architecture of spatiotemporal coordinates, an architecture which houses a multiplicity of individual coordinate systems. And, it might be argued, it is plausible to assume that these coordinate systems reflect, in some sense, an underlying intrinsic metric, the coordinates merely serving to pick out (e.g.) equalities and inequalities which were, in effect, already there (Gerald J. Massey, indeed, makes a related argument to this effect (Massey, 1969: 339-341)).

Grünbaum, however, is adamant that the coordinate systems do not merely serve to pick out any underlying, pre-existing metrics. The designation of particular coordinates will always, as he notes, depend on the choice of the point of origin. And, in terms of, for example, certain distance functions, the choice of the point of origin can affect whether or not a particular equality holds. For example, consider the distance function:

$$\text{Equation (1): } D_2(a, b) = (b + a) |b - a| \text{ (Grünbaum, 1973: 518).}$$

This yields an equality in terms of the two pairs of points labelled (or *named*) by the coordinates 0 and 6, and 8 and 10 ((6 x 6) = (18 x 2) = 36). However, had the point of origin been chosen, as it were, one place to the left, such that the pairs had been named 1 and 7, and 9 and 11, respectively, the equality would no longer hold ((8 x 6) = 48, but (20 x 2) = 40) (Grünbaum, 1973: 518, 522-523). Accordingly, assigning particular coordinates to the end-points of an arbitrary interval of space does not amount to a specification of any intrinsic feature of that interval, the coordinates assigned being dependent on what Grünbaum calls an external “*name-giver*” (Grünbaum, 1973: 506). In practice, since Einsteinian spacetime is continuous, the names given to the coordinates will be elements of the real number line, since the real number line is the only continuous number line. Hence, as Grünbaum summarises his position:

“The assignment of real numbers to points of physical space... effects only a *coordinatization* but not a *metrization* of the manifold of physical space. No informative metrical comparison among individual points could be made by comparing the magnitudes of their real number coordinate-*names*” (Grünbaum, 1973: 16).

And, indeed, support for Grünbaum’s view is to be found in Einstein’s own words. For example, Einstein tells us that the four coordinates attributed to every point in the spacetime continuum:

“... have not the least physical significance, but only serve the purpose of numbering the points of the continuum in a definite but arbitrary manner” (Einstein, 1916: 95).

Overall, therefore, I suggest that the fact that an architecture of coordinates can be applied to a continuous domain such as spacetime is not necessarily reflective of the obtaining of an intrinsic metric within that domain.

With that point dealt with, I want next to consider, in broad terms, what it is that Einstein is undertaking to achieve in his exposition of relativity theory. Relativity theory can be thought of as a theory which provides, in a simplest form, a formulation of the laws of nature – including those laws of nature revealed by Maxwell’s equations describing the electromagnetic field (see section 5.1). Indeed, in the context of the general theory of relativity, Einstein refers to the underlying “... *[requirement] of the greatest possible logical simplicity of the laws*” (Einstein, 1916: 154). More elegiacally, he tells us that: “*The simpler our picture of the external world and the more facts it embraces, the stronger it reflects in our minds the harmony of the universe*” (Einstein and Infeld, 1938: 213). Einstein is also clear that the requirement, in terms of the special theory, that the laws of nature be invariant under Lorentz transformation (section 5.1) imposes limits on what might properly be regarded as laws of nature. Indeed, in terms of the general theory, whereby the laws of nature are invariant with respect to arbitrary continuous transformations of Gaussian coordinates (this will be discussed in section 5.9), the limits on what might properly be regarded as laws of nature are even stricter (Einstein, 1916: 151, 154). This suggests, I think, that, whilst it wields perhaps unrivalled explanatory and predictive power, Einstein’s relativity theory, in providing, in a simplest form, a formulation of the laws of nature, is not also seeking to provide a complete metaphysical description of all of those things to which it makes reference.

Also interesting in this context is the way in which, in explicating relativity theory, Einstein makes use of the pre-relativistic notions of space and time. Classical (pre-relativistic) physics posited an absolute space and an absolute time (Einstein, 1916: 145). In consequence, Einstein notes, the idea of a four-dimensional reality was not first suggested in the special theory of relativity. Rather, in classical physics, too, an event is localised by four numbers – three spatial coordinates and a time coordinate – with events as a totality regarded as occupying a four-dimensional continuous domain (Einstein, 1916: 151). The principal impact of the special theory in this regard, particularly as that theory is elucidated by Hermann Minkowski (1908), was then to erode the objective, classical distinction between, on the one hand, the three spatial dimensions and, on the other, the single time dimension. As Minkowski himself encapsulates this shift in thinking:

“Henceforth space by itself, and time by itself, are doomed to fade away into mere shadows, and only a kind of union of the two [i.e., spacetime] will preserve an independent reality” (Minkowski, 1908: 75).

That said, however, it is, in fact, far from clear the extent to which Einstein is deriving spacetime from the old classical notions of space and time. For example, he says that, of the four coordinates attributed to every point in the spacetime continuum, it need not be the case that three refer to “*space*” and the other to “*time*” (Einstein, 1916: 95). Rather, as has been said above, the coordinates only serve the purpose of numbering the points of the continuum in a definite but arbitrary manner. And Einstein further suggests that the “*concepts space [and] time*” (Einstein, 1916: 144) are of merely psychological origin, such concepts first arising in the form of ordering principles for subjective experience (Einstein, 1916: 142-146). As such, the concepts space and time are:

“... free creations of the human intelligence, tools of thought, which are to serve the purpose of bringing experiences into relation with each other, so that in this way they can be better surveyed” (Einstein, 1916: 144).

The use of the word “*concept*” is not completely clear here, but Einstein does not seem to have in mind that space and time necessarily have, in addition, a separate fundamental metaphysical existence, distinct from the concepts of them. Given this, it can plausibly be thought, I suggest, that Einstein chose to inherit the notions of space and time from classical physics as a way of reflecting the evolution of the classical model into the relativistic model, rather than necessarily to acknowledge their place in a fundamental reality.

To turn more specifically to the spatiotemporal metrical structure which Einstein applies within spacetime, we have seen in section 5.7 that Grünbaum argues that Einsteinian spacetime is intrinsically metrically amorphous. This means, for example, that the equality or inequality of two temporal intervals is not an intrinsic feature of continuous spacetime itself. Rather, such intervals are equal or unequal only in terms of some external physical standard such as the ticking (or what Einstein likes to call the “*rhythm*”) of an extraneous clock (Einstein and Infeld, 1938: 182). And, very much in line with this, Einstein himself is clear that relativity theory does not, *in and of itself*, suggest the idea that considerations of equality and inequality can be referred to a system of clocks, or to a system of measuring rods. Rather:

“One is struck [by the fact] that the theory ...introduces two kinds of physical things, i.e., (1) measuring rods and clocks, (2) all other things, e.g., the electro-magnetic field,

the material point, etc... [It] was clear from the very beginning that the postulates of the theory are not strong enough to deduce them from sufficiently complete equations for physical events sufficiently free from arbitrariness, in order to base upon such a foundation a theory of measuring rods and clocks".³²

This is to say, in other words, that relativity theory alone cannot provide a grounding for the measuring rods and clocks which bring substance to the spatiotemporal metrical structure of spacetime by serving as the arbiters of equality/ inequality judgements. In consequence, as Einstein puts it, measuring rods and clocks have to be introduced into relativity theory as "... *theoretically self-sufficient entities*".

What, though, it might be wondered, justifies the introduction of measuring rods and clocks into relativity theory in this way? Introducing them in this way, Einstein tells us, is justified because it makes possible a "*physical interpretation*" of the coordinate systems which relativity theory involves. It benefits relativity theory, this is to say, if we can tacitly assume that space is something that can be divided up into segments which correspond to the length of one or more measuring rod. Similarly, time can fruitfully be envisioned as something that can be divided up into units which correspond to the ticking of a clock. By deploying measuring rods and clocks in this way we can depict, not just a manifold of events, but a manifold with a *physical metrical structure*. And, whilst the physical interpretation of the coordinate systems which the introduction of measuring rods and clocks permits is an interpretation which the theory could, in fact, "*forego*", it benefits the elucidation of the theory to include it. Nevertheless, the depiction of the spatiotemporal metrical structure of the manifold as something which might be marked out in terms of measuring rods and clocks is something which is essentially extrinsic to relativity theory.

What this indicates, I suggest, is that the spatiotemporal metrical structure of the manifold, as it is customarily portrayed, is, to echo some wording from the opening sentence of section 5.7, just one way in which whatever understanding we might come to have of the manifold of events might be shaped. Whilst it does have the advantage of providing for a physical interpretation of the relations in which events stand to one another, this is an interpretation which is necessarily introduced from outside of relativity theory itself, and one with which the theory could in any case dispense. As such, it appears that the spatiotemporal metrical structure, at least as it is customarily portrayed, is deployed more for elucidatory purposes than because

³² This quote, and the quotes in the rest of this paragraph and the paragraph which follows, are from Einstein's *Autobiographical Notes* (1949), cited at Barbour, 2007: 597.

the particular portrayal necessarily reflects any underlying aspect of metaphysical reality. Once again, therefore, it seems plausible that Einstein's employment of the notions of space and time, as reflected in the characterisation of the spatiotemporal metrical structure, is mainly intended to reflect the evolution of the classical model into the relativistic model. As such, it principally serves a heuristic purpose, rather than its forming any part of a complete metaphysical description of those things which relativity theory involves.

5.9 Empty space?

Finally in the context of the evolution of the classical model into the relativistic model, it is fruitful to ask to what extent the characterisation of spacetime in relativity theory might match the classical conceptions of space and time. In terms of classical physics, both space and time are a kind of "container" – the spatial container being where objects are located; the temporal container being where events happen. Importantly, both containers are self-standing in the sense that they would still be there in a complete absence of objects, or of events.³³ Einstein (albeit in a different context) does himself consider this issue – and arrives at quite a subtle conclusion. (It should be noted that this section will make frequent reference to spatial coordinates, temporal coordinates, and related notions. This has been done to reflect Minkowski's paradigmatic characterisation of (special relativistic) spacetime. As such, it should not be thought to be in conflict with Einstein's comment (cited in section 5.8) that, of the four coordinates attributed to every point (or event), it need not be the case that three refer to space and the other to time (Einstein, 1916: 95).)

To take, first, the special theory. In section 5.1, and elsewhere in this chapter, it has been said that all of the events within spacetime can be contemplated from different viewpoints, or different perspectives, represented by different individual systems of coordinates. As was said in section 5.1, the special theory deals, in particular, with those systems of coordinates which comprise inertial systems in relative uniform rectilinear motion. These inertial systems are inter-translatable via application of the Lorentz transformation. In the case of uniform rectilinear relative motion, this is to say, we can calculate the four coordinates pertaining to one coordinate system based upon those pertaining to another, in such a way as to preserve the invariance of the laws of nature, by deploying the Lorentz transformation. Following Minkowski's characterisation of the special theory, it has generally been taken to be the case

³³ The idea of time as a self-standing container corresponds to the description of Newtonian time in section 2.5.

that, within spacetime, each inertial space, and its associated time, just is one of these four-dimensional systems of coordinates (Minkowski, 1908; Einstein, 1916: 151-152).

To expand upon what was said about Lorentz transformation in section 5.1, consider the equation:

$$\text{Equation (2): } ds^2 = dx_1^2 + dx_2^2 + dx_3^2 - dx_4^2$$

In this equation (which I will call equation (2)), x_1 , x_2 and x_3 are the spatial coordinates of an event, expressed in terms of a three-dimensional “space-like” cross section of spacetime. In a way analogous to the Pythagorean theorem, $dx_1^2 + dx_2^2 + dx_3^2$ is then the square of the spatial separation of two “*infinitesimally neighbouring*” points of the cross section (Einstein, 1916: 155). Finally, dx_4 is the temporal separation of two events with common x_1 , x_2 and x_3 . As such, equation (2) portrays the metrical character of the spacetime of the special theory. As Einstein notes, it also encapsulates the way in which the spacetime of the special theory represents the simplest conceivable special case possible in natural law (Einstein, 1916: 155).

The importance of equation (2) for current purposes is that ds^2 is one of those things which is invariant with respect to Lorentz transformation. As such, what Einstein terms an “*objective metrical significance*” is to be attached to equation (2) (Einstein, 1916: 155).³⁴ Indeed, equation (2), and the invariance of ds^2 , will hold for any test body which might be introduced into the spacetime of the special theory. In this sense, the spacetime of the special theory can be thought of as a “*metric space*” which serves to mould the inertial behaviour of any test body which it might contain (Einstein, 1916: 156 (fn. 1)). It imbues, it might be put, each and all of its contents with its metrical personality. As a result, any description of “... *that which fills up space*” (and which is, therefore, dependent on the coordinates) will need to make reference to the embedded metrical properties which the coordinate systems furnish, at risk of otherwise being incomplete to the point of meaninglessness (Einstein, 1916: 156).

What this starts to suggest is that the spacetime of the special theory is something which obtains prior to its contents – indeed, something which has to obtain prior to its contents if

³⁴ To be clear, this is not to suggest, contrary to what has been said in section 5.7, that spacetime is other than intrinsically metrically amorphous. Rather, equation (2) reflects the measuring rods and clocks which, as said in section 5.8, have been introduced into relativity theory from the outside (Einstein, 1916: 33, 119, 154).

those contents are ever to be fully metrically specifiable. Put the other way round, if that which fills up space were to be removed, there would still remain the metric space modelled on equation (2) (Einstein, 1916: 156 (fn. 1)). The spacetime of the special theory, in other words, has an existence independent of its contents – independent, indeed, of its even having any contents. It obtains, we can say, in the guise of its constitutive metrical character, armed and ready to determine the metrical properties, and the inertial behaviour, of any test body which might be introduced into it. As such, it is “... *an independent component in the representation of physical reality*” which is able to obtain as “*empty space*” (Einstein, 1916: 152, 153). Consistently with the space and time of classical physics, it is “... *a kind of stage for physical happening*” (Einstein, 1916: 147). Consistently with classical physics, this is to say, it is a self-standing container (Einstein, 1916: 147, 152-156).

In terms of the general theory, however, things are markedly different. We have seen that Einstein applies a spatiotemporal metrical structure to the manifold which he equips with measuring rods (and also clocks) so as to allow a physical interpretation of the systems of coordinates. The inertial systems of the special theory (inertial systems in relative uniform rectilinear non-rotary motion) lend themselves readily to this system of measuring rods because, as Einstein notes, such systems are Euclidean. This means that, in the case of the special theory, “... *the theorems on “lengths” in Euclidean geometry hold*” (Einstein, 1916: 154), such that it is a straightforward matter to compare, or to aggregate, different measuring rods (Einstein, 1916: 83-86). In terms of the general theory, however, systems in relative motion other than just the uniform rectilinear non-rotary motion of the special theory are also accommodated. For example, the general theory can accommodate two systems with reference to one of which the other is uniformly accelerating. If the first system is an inertial system, then the second system, on this basis, is not. Further, the second system, in consequence of its acceleration, also introduces the idea of a gravitational field. This example, of course, still reflects a fairly simple case of relative motion. In keeping with the general theory, we have to be prepared to accept, not just relative uniform acceleration as in this example, but relative motions of any kind, however complex and random (Einstein, 1916: 153, 154).

This idea of more complex and random relative motions complicates the application of the measuring rods, since it is only in inertial, Euclidean systems that the required comparisons and aggregations can be effected. Hence, if the physical interpretation of coordinate systems which measuring rods (and clocks) allow is to be retained in the general theory, a way has to be found to fit inertial, Euclidean systems into the compass of the general theory. Fortunately, this can be done. The way in which it can be done is by assuming that the uneven and irregular

canvas of general relativistic spacetime can be broken up into regions small enough to be approximately Euclidean. Every point of general relativistic spacetime, this is to say, is presumed to occupy an indefinitely small local neighbourhood which approximates to an inertial, Euclidean system.³⁵ On this basis, the business of comparison and aggregation which underpins the physical interpretation of the coordinate systems can be resumed – albeit on an infinitesimally tiny scale.

A further consequence of the introduction of non-inertial systems in the general theory is that coordinate systems are no longer necessarily inter-translatable by means of Lorentz transformation. Rather, as was touched upon in section 5.5 (footnote 24), in place of Lorentz transformation it is necessary to deploy Gaussian coordinates. Indeed, this move ties in with the discussion of indefinitely small local neighbourhoods above. This is because Gaussian coordinates can be assigned to the points of the spacetime continuum in a sufficiently fine-grained fashion to deal with the indefinitely small (approximately) Euclidean regions being posited. And, in particular, the use of Gaussian coordinates can take the place of Lorentz transformation because any one Gaussian coordinate system can be redescribed in terms of any other whilst holding the laws of nature invariant (and, unlike with Lorentz transformation, whatever the relative motion of the coordinate systems under consideration might be). As Einstein puts it:

“... by application of *arbitrary substitutions* of the Gauss [co-ordinates], ...the equations [which express the general laws of nature] must pass over into equations of the same form; for every transformation (not only the Lorentz transformation) corresponds to the transition of one Gauss co-ordinate system into another” (Einstein, 1916: 98).

Thus: “*All Gaussian co-ordinate systems are essentially equivalent for the formulation of the general laws of nature*” (Einstein, 1916: 97), the general laws of nature being invariant across all Gaussian coordinate systems “... *whatever may be their state of motion*” (Einstein, 1916: 63). And this essential equivalence across Gaussian systems is, Einstein tells us, the “... *fundamental idea of the general principle of relativity*” (Einstein, 1916: 97). Accordingly, the general theory introduces the idea of arbitrarily chosen, continuous transformations of coordinates, rather than just the restricted Lorentz transformations of the special theory. The Lorentz transformation, as it applies to more restricted states of motion, can be seen to be a

³⁵ This corresponds to the description of what constitutes a manifold in section 5.6. In terms of the special theory, however, the special relativistic manifold is also homeomorphic to Euclidean 4-space on a non-local scale.

limiting case of this wider analysis (Einstein, 1916: 15, 32-39, 62-63, 89-90, 97-98, 119, 121, 151; Einstein and Infeld, 1938: 82, 169, 171, 177-193, 201-206, 213).

To see the relevance of this to the matter in hand, we need to return to ds^2 from equation (2). As was said, in terms of the special theory, ds^2 carries objective metrical significance – an objective metrical significance which, in the case of the special theory, is derived directly from the coordinate values in terms of which ds^2 is expressed (as equation (2) shows). In consequence, the coordinate systems constituting the spacetime of the special theory were said to confer a metrical structure onto the contents of that spacetime. However, in terms of the general theory, ds^2 is no longer directly expressible in terms of coordinates. Rather, it is now to be expressed in terms of *functions* of coordinates (this is related to the reference to a gravitational field above, since fields themselves are described in terms of functions of coordinates). Accordingly, the coordinates now have a less direct bearing on ds^2 . Furthermore, as has been said, rather than their comprising the select group of coordinate systems which are linked by Lorentz transformation, the Gaussian coordinates of the general theory are determinable by arbitrarily chosen, continuous transformations, all Gaussian systems (as above) being “*essentially equivalent*” for the purpose in question (Einstein, 1916: 97, 155). In consequence, the coordinates systems of the general theory lose any privileged standing in terms of what they bring to ds^2 . As a result, the objective metrical significance ascribed to the coordinates in terms of the special theory is, as regards the general theory, completely dissipated.

One consequence of this is that, in direct contrast to what was said above about the spacetime of the special theory, the spacetime of the general theory does *not* obtain, in the guise of its constitutive metrical character, armed and ready to determine the metrical properties, and the inertial behaviour, of any test body which might be introduced into it. Indeed, the spacetime of the general theory fails to have any such (inherent) constitutive metrical character. Accordingly, in terms of the general theory, the contents of spacetime are held to be fully metrically specifiable apart from that spacetime. Relatedly, unlike with the special theory, the spacetime of the general theory is not something which has to obtain prior to its contents. Turning this thought around, if the last inhabitant of general relativistic spacetime – a gravitational field, say, described in terms of functions of Gaussian coordinates – were removed, there would remain behind, not some general relativistically empty space, but “*absolutely nothing*” (Einstein, 1916: 157). This is because the functions of the Gaussian coordinates describe not only the field but, in doing so, describe, at the same time, the metrical structural properties of the manifold (Einstein, 1916: 156-157). Absent the gravitational field,

therefore, nothing by way of a “*field-free*” spacetime (nor, indeed, anything else) would be left standing (Einstein, 1916: 155).

This suggestion of some kind of a field-free spacetime does, however, introduce one final point. The spacetime of the special theory would, after all, seem to be just such a field-free spacetime. Hence, wouldn't the removal of (say) the gravitational field from general relativistic spacetime result, not in “absolutely *nothing*”, but in the kind of spacetime obtaining in a special relativistic universe (Einstein, 1916: 155, 157)? In fact: no. This is because the spacetime of the special theory, as viewed through the prism of the general theory, is not, in fact, field-free. Rather, it is the special case of a spacetime with a field which is described by functions that have values which do not depend on the coordinates of the particular coordinate system in play (Einstein, 1916: 157). Accordingly, the point remains that, in terms of the general theory, there simply cannot obtain a spacetime without a field. There just is, this is to say, no spacetime which is an empty spacetime – no such thing as empty space. As such, general relativistic spacetime cannot claim a distinct existence, separate from the actual objects of physical reality. In consequence, these objects, in terms of the general theory, are spatially extended, but they are not *in space* (Einstein, 1916: x, 156-157). And, therefore, in contrast to the space and time of classical physics, and in contrast to the spacetime of the special theory, general relativistic spacetime is not a self-standing container.

5.10 Concluding comments

It has been seen in Parts 1 and 2 of this chapter that, in particular in virtue of its demonstrating that simultaneity is a relative relation rather than an absolute relation, relativity theory serves to undermine the idea of objective, absolute Change as it is presented in the A-theory. As such, relativity theory serves to unsettle the A-theory whilst, correspondingly, lending support to the B-theory. Various arguments which seek to reconcile the A-theory with relativity theory are, I have claimed, unpersuasive. The proposal from chapter 3 that the world, in not containing mind-independent, objective, absolute Change, is a world which is, in this sense, objectively B-theoretic has, therefore, been further supported.

In Part 3 of this chapter, the intention has been to present a case that, whilst I have claimed that relativity theory serves to undermine objective, absolute Change as it is presented in the A-theory, relativity theory need not be thought to rule out the notion of metaphysically significant Change obtaining relative to a particular frame of reference, such as the posited subjective temporal frame of reference. In this context, following a discussion of Grünbaum's

argument to the effect that Einsteinian spacetime is intrinsically metrically amorphous, it has been noted that the spatiotemporal metrical structure which Einstein applies to the manifold of events is not something which is born out of relativity theory itself. Rather, as Einstein himself reports, it is something, extrinsic to relativity theory, which allows for a physical interpretation of the coordinate systems which relativity theory involves. On this basis, I have suggested that Einstein is deploying the spatiotemporal metrical structure principally as a useful explanatory tool in the context of relativity theory as a whole, rather than because it is an essential constituent of that theory. It has also been noted that, in terms of the general theory, spacetime is afforded no existence apart from its contents whereas, in contrast, in terms of the special theory, spacetime is said to comprise an independent component of physical reality.

Drawing these thoughts together, I suggest that it need not be thought that relativity theory is seeking to provide a complete metaphysical description of all of those things to which it makes reference. Rather, in its providing, in a simplest form, a formulation of the laws of nature, relativity theory is characterising, and deploying, certain ingredients of that theory in the interests of the elucidation of the theory as a whole, rather than because these ingredients arise as a consequence of the theory or because the theory is intended to provide a complete specification of them. In the specific case of time and space, I have further suggested that it is plausible to suggest that Einstein, in his presentation of time and space within relativity theory, was influenced by a concern to demonstrate the evolution of relativity theory from, in particular, classical physics. Overall, therefore, it need not be thought, I suggest, that, in his depiction of time and space in relativity theory, Einstein is seeking to provide a rigorous, and autonomous, description of them, nor to rigorously delimit the characterisation of them as it might be stated from the perspective of metaphysical reality. On this basis, and despite the weight rightly accorded to relativity theory, I suggest that it need not be thought that Einstein's treatment of time within that theory serves to countermand the prospect of metaphysically significant Change obtaining relative to a particular frame of reference such as the subjective temporal frame of reference.

That said, however, might the claim that relativity theory (or, indeed, physics more generally) does not delimit the boundaries of metaphysics be used to restore the notion of mind-independent, objective, absolute Change as it is presented in the A-theory? For example, might the A-theorist use this claim to build an argument that, whilst physics has no need of a relation of absolute simultaneity within its formulation of the laws of nature, this is not to say that such a relation cannot be appealed to on metaphysical grounds? As such, the A-theorist, rather than following Stein and Hinchliff in accepting the abandonment of the absolute

character of simultaneity (section 5.4), would instead be seeking to *reinstate* that absolute character, the claim being that, whilst physics provides an account of the physical world in which a relation of absolute simultaneity plays no part, physics does not rule out there being such a relation as a matter of (metaphysical) fact. Indeed, in section 5.5, consideration was given, in the context of Gödel universes, to an argument involving an appeal to metaphysics with regard to whether tense might be a contingent feature of the universe. This argument, it was suggested, was unsuccessful (as will be further suggested below). But might a differently presented argument go through?

One A-theorist who seeks to pursue this course is Ned Markosian, who constructs his argument in the following way. Scientific theories, Markosian notes, tend to have a “... *good deal of philosophy built into [them]*” (Markosian, 2004: 74). Indeed, as Lawrence Sklar has similarly made the point, it is usually the case that, in the formulation of a scientific theory, certain “*metaphysical presuppositions*” have gone into that formulation (Sklar, 1981: 131). What Markosian then suggests is that it is worthwhile to try to ascertain how “*philosophically rich*” a scientific theory might be – how much “*philosophical baggage*” it might have acquired (Markosian, 2004: 74). For example, in the case of the special theory of relativity, should we regard the special theory as being sufficiently “... *philosophically robust... to make it either literally contain or at least entail the proposition that there is no such relation as absolute simultaneity*”. Or, instead, should it be thought of as being “*philosophically austere*” to the point that, whilst it is “*empirically equivalent*” to the philosophically robust version, it does *not* contain, nor even entail, the proposition that there is no such relation as absolute simultaneity (Markosian, 2004: 75)? If it is the “*philosophically austere*” interpretation of the special theory which is to be preferred – the interpretation, that is, which, whilst it has no place for a relation of absolute simultaneity, does not rule out there in fact being such a relation – then this might, indeed, clear the way for an appeal to be made to a relation of absolute simultaneity on metaphysical grounds.

This idea of an appeal being made to a relation of absolute simultaneity on metaphysical grounds can be explored via a consideration of “hyperplanes” (something touched upon in section 5.5). As applied to relativity theory, a hyperplane is a three-dimensional slice of four-dimensional spacetime which is orthogonal to the world-line of an entity considered at rest in a particular frame of reference, all of the events on such hyperplane being simultaneous with one another with respect to that frame of reference. The process of slicing up spacetime so as to determine all of the hyperplanes orthogonal to such a world-line is known as “foliation”, a process which can be performed with regard to all other relevant world-lines, too. Dependent on the choice of world-line and, as it were, on the consequent inclines of the orthogonal

slicings, different events will come to be on the same hyperplane as each other. And, crucially, from the standpoint of relativity theory, each world-line and, therefore, each foliation, is equally legitimate. Accordingly, no set of hyperplanes resulting from any particular foliation is to be privileged over any other. As such, none of the sets of events on any particular hyperplane is to be privileged over any other. Thus, whilst the events on any one hyperplane are simultaneous with reference to a particular frame of reference, no such set of events is to be thought of as comprising events which are “really”, or “absolutely”, simultaneous. In other words, as has been established over the course of this chapter, there is, from the standpoint of physics, no relation of absolute simultaneity (Miller, 2013: 348, 352; Bourne, 2006: 207).

In terms of what the A-theorist might then say in this regard, the point can be expressed most sharply in terms of presentism. The presentist’s central claim, of course, is that only what is present is real. In this context, this amounts to the claim that, despite the pronouncements of physics, there is, after all, just one “correct” way of foliating spacetime, with just one hyperplane of that foliation representing the one, existing time (i.e., the present) and the events at that time. In other words, there *is* a privileged hyperplane. Now, the presentist is not claiming that we could ever determine, or detect, which hyperplane is privileged. If we could, this would mean that the privileging were at a physical, or empirical, level, something which we have seen relativity theory to deny. But the claim that the presentist is seeking to establish is that, although we cannot know which hyperplane is privileged because the privileging is empirically epiphenomenal, this doesn’t rule out there being a hyperplane which is privileged from a metaphysical standpoint. After all, to claim (as I have claimed) that physics does not delimit the boundaries of metaphysics must be to embrace the idea that being on a par physically speaking need not mean also being on a par metaphysically speaking. And, in appealing to a (metaphysically) privileged hyperplane, the presentist is also appealing to a privileged frame of reference, and to a set of events which, in their being simultaneous relative to that privileged frame of reference, are simultaneous, not just relatively, but absolutely (Bourne, 2006: 179, 182-186; Miller, 2013: 348, 352).

On this basis, the presentist could indeed claim to render presentism consistent with relativity theory. However, this approach is, I suggest, vulnerable in two ways. First, in terms of Markosian’s account, it is reliant upon our being able to justify the claim that it is the “*philosophically austere*” interpretation of the special theory which is the interpretation to be preferred. Since, as we have seen Markosian to acknowledge, both interpretations (the austere one, and the robust one) are “*empirically equivalent*” (Markosian, 2004: 75), we cannot, as has been said, appeal to physical, or empirical, considerations to guide our preference. Recognising this, Markosian bases a conclusion that it is the philosophically

austere interpretation that is the “*true*” interpretation on his “... [believing] there is good *a priori* evidence” to favour the austere interpretation over the robust interpretation (Markosian, 2004: 75). However, in his not providing any indication as to what this *a priori* evidence might comprise (or, indeed, what form it might take), Markosian’s favouring of the philosophically austere interpretation does seem rather stipulative.

Further, it can also be argued that, whilst this approach has been said to render presentism consistent with relativity theory, it has, in so doing, removed a key motivation for positing a presentist (or any other A-theoretic) account of time. As mentioned in section 2.2, one of the principal motivations for the various A-theories of time, including presentism, is the way in which the A-theory captures certain intuitions which we have with regard to time, such as real Change, and the specialness of the present moment. Our temporal phenomenology, we might put it, is taken seriously by the A-theorist, its being, it is claimed, reflective of certain real features of the world (Prosser, 2007: 77; cf. Bourne, 2006: 1, 2, 15, 18). However, if, as all agree, we cannot ascertain which hyperplane is metaphysically privileged because its being metaphysically privileged leaves no empirical footprint, then there would seem no basis on which its being metaphysically privileged might ground our temporal phenomenology. And, if our temporal phenomenology is not grounded in a hyperplane’s being (metaphysically) privileged, there would seem little incentive to posit a tensed theory of time, such as presentism, which requires such a hyperplane – particularly when physics gives us no reason to do so (Miller, 2013: 352-354). As referred to above, in section 5.5 various arguments were given which suggested that, in the context of Gödel universes, it would not assist the A-theorist to claim that a universe’s being tensed or tenseless is a contingent matter dependent on brute metaphysical fact. Equivalently to what has just been said, the argument in section 5.5 could also have been made in the terms that, whilst our temporal phenomenology might have A-theoretic leanings, these A-theoretic leanings could not be grounded in the actual universe’s happening to have the contingent metaphysical (but not empirical) feature of being tensed and, nor, therefore, could our temporal phenomenology be appealed to as motivating an A-theoretic account of time. Overall, therefore, in my claiming that physics does not delimit the boundaries of metaphysics, I do not believe that I am claiming anything that might be used to restore the notion of mind-independent, objective, absolute Change in the context of a relativistic world.

6

Gareth Evans on egocentric and objective space

Chapter 4 introduced the idea that the temporal domain might be described in terms of both an objective temporal frame of reference, and a subjective temporal frame of reference – two frames of reference which were said to be in motion relative to one another. As these two frames were depicted, I suggested that, relative to the objective temporal frame of reference, Change does not obtain. Relative to the subjective temporal frame of reference, however, it does. One of the purposes of chapter 5 was then to present arguments to the effect that relativity theory does not rule out the notion that Change of a metaphysically significant kind might obtain relative to a particular frame of reference, such as the subjective temporal frame of reference.

In this chapter, and in chapters 7 and 8, I seek to construct an argument to the effect that the subjective temporal frame of reference is, with reference to some, though not all, accounts of experiencing subjects, to be accorded metaphysical significance. If so, then it follows that the Change which obtains relative to the subjective temporal frame of reference is also to be accorded metaphysical significance, at least with reference to the accounts of experiencing subjects in question. The purpose of this chapter is to take a first step in the construction of this argument. This first step consists in the securing of the notion that one and the same domain can, as I am proposing, be legitimately and equivalently described in terms of both a subjective, and an objective, frame of reference. (Galileo's account of the motion of objects in the domain of space, as discussed in chapter 4, involves, it might be recalled, only objective frames.) To this end, the chapter proceeds as follows. In section 6.1, it is shown that Gareth Evans, within his account of demonstrative identification, describes the domain of space in terms of both an objective, and a subjective (or an "*egocentric*") frame of reference. Sections 6.2 and 6.3 then demonstrate that Evans's methodology can, or so I argue, be applied to the domain of time. In this way, Evans's account serves to support the idea that both objective and subjective frames of reference can, legitimately and equivalently, be applied, not only in the spatial domain, but also in the temporal domain. However, whilst, I claim, this brings philosophical respectability to the notion of the subjective temporal frame of reference, it falls short of demonstrating its mooted metaphysical significance with reference to at least some accounts of experiencing subjects. Section 6.4 sets out the basis on which this metaphysical

significance is to be defended – a theme which is then developed over the chapters which follow.

6.1 What Gareth Evans tells us about space...

In *The Varieties of Reference* (1982), Gareth Evans sets out an account of demonstrative identification. One of the things which this account involves is the notion of a subjective space – a subjective space which he terms “*egocentric space*” (Evans, 1982: 154). This egocentric space, Evans tells us, is that space, with its coordinates specified in terms of up/down, left/right and in-front/behind, at the centre (or point of origin) of which a subject conceives themselves to be (Evans, 1982: 153-154). (As in chapter 4, for the purposes of this chapter the subject can be thought of as being, in some very general sense, an ordinary human subject pursuing an ordinary course of experience through the world.) This centre, or point of origin, we can think of as constituting the subject’s subjective “*here*” – “*here*” denoting, as Evans puts it, “*a more or less extensive area which centres on the subject*” (Evans, 1982: 154). As such, the subjective “*here*” coincides with the seat of the subject’s “*perspective*”, or their “*point of view*” on the world (Evans, 1982: 152, 156). Accordingly, egocentric space can be seen to play a key role in a subject’s “*here*”-thoughts, “*here*”-thoughts being one aspect of “*thinking egocentrically about space*” – one aspect, that is, of thinking about spatial positions in terms of a framework centred on the subject’s body (Evans, 1982: 154).

Egocentric space, and “*here*”-thoughts, also play a part in relation to perceptions and actions – egocentric space providing the location for the objects of perceptions and actions. When one perceives an object, “*information-links*” (Evan, 1982: 144) with that object provide information which enables one to locate it in egocentric space (as, say, *to the left*) and, in consequence, to act appropriately with regard to it.³⁶ This general line of thinking can also be seen to be endorsed by John Campbell, in his saying that:

“Any animal that has the relations between perception and behaviour needed to direct action at particular places, to reach for things it can see, must be capable of egocentric spatial thinking” (Campbell, 1994: 5).

³⁶ An “*information-link*” is a link “... *between subject and object, which provides the subject with (non-conceptual) information about the states and doings of an object over a period of time*” (Evans, 1982: 144).

Evans considers “*here*”-thoughts to be of the same general kind as demonstrative thoughts about normal physical objects (what he calls “*this*”-thoughts (Evans, 1982: 179)), though he does note certain differences. For example, Evans tells us that, in the case of “*here*”-thoughts, we do not need actually to be receiving information from our current location in order to think of it as *here*. This is to say, provided the relevant information-link exists, it can, nevertheless, lie dormant. This is markedly different from the case of “*this*”-thoughts about normal physical objects, such thoughts being “... information-based thoughts *par excellence*” – indeed, “... *the mother and father of all information-based thoughts*” – such that a shutting-down of the relevant information-link would leave us having to resort to guesswork about the “... *states and doings*” of the object in question (Evans, 1982: 152, 145, 144, respectively). Indeed, as Evans suggests, this difference between “*here*”-thoughts and “*this*”-thoughts is so marked that it might even imply that “*here*”-thoughts should not be regarded as demonstrative thoughts at all but, rather, as *descriptions* – *here* being, for example, “*the place I occupy*” (Evans, 1982: 153). However, such a descriptive account should be rejected, Evans tells us, for two reasons. First, a descriptive account would sever the connection, referred to above, between “*here*”-thoughts, perception, and action – a connection which Evans claims is essential to “*here*”-thoughts. As he puts it: “Where there is no *possibility* of action and perception, ‘here’-thoughts cannot get a grip” (Evans, 1982: 153). Secondly, a descriptive account of “*here*”-thoughts would, Evans notes, presuppose that “*I*” has a primacy over “*here*” (“*I*”, for example, being presupposed in (as above) “*the place I occupy*”) – a primacy which he does not endorse. Rather, on Evans’s account, the indexicals “*I*” and “*here*” are inter-defined, forming what might be thought of as a local holism. “*I*”-thoughts and “*here*”-thoughts just are, he claims, “... *two sides of a single capacity, each wholly dependent upon the other*” (Evans, 1982: 256). As such, neither can be defined without the other. Rather, “*I*”-thoughts and “*here*”-thoughts are given to us in tandem, delivered up as a package (Evans, 1982: 144, 152-153; 170; 205; 215-216; 256).

A further feature of “*here*”-thoughts, Evans tells us, is that they are immune to error through misidentification. If, for example, it seems to a subject, simply by their feeling it to be hot, that the property of places “*being hot*” is instantiated, then it *ipso facto* seems to them that it is hot *here* (Evans, 1982: 183; 184-191). They do not, this is to say, feel it to be hot *somewhere*, to then have to marshal their resources to infer that that somewhere is *here*.³⁷

³⁷ Strictly speaking, Evans makes certain of his arguments in terms of what he calls “*Ideas*” (with a capital “*I*”), an “*Idea*” being “... *something which makes it possible for a subject to think of an object in a series of indefinitely many thoughts, in each of which he will be thinking of the object in the same way*” (Evans, 1982: 104). These Ideas include “*here*”-Ideas, “*I*”-Ideas, and “*this*”-Ideas (Evans, 1982: 165,

To step back from this consideration of “*here*”-thoughts, it is of interest to ask (as Evans himself asks) how it is that perception makes any sort of demonstrative thought possible in the first place (Evans, 1982: 143, 145). The answer, Evans tells us, lies in our ability, based upon perception, to locate an object in space (*perception* here being characterised in terms of a subject’s having an information-link with the object in question) (Evans, 1982: 150). Accordingly, it is perception, in locating an object in this sense, which allows for the individuation, and the identification and reidentification, of the object, thereby making demonstrative thought about it possible.

Now, this, perhaps, seems obvious – its having been said above that egocentric space provides the location for the objects of perceptions, and for associated actions. But Evans’s point goes further than this. His point is that, for demonstrative thought to be possible, we need, via perception, to locate an object, not just in egocentric space, but also in what he calls “*objective space*” (Evans, 1982: 162) – “*objective*” in the sense of its being “... *from no point of view*” (Evans, 1982: 152).³⁸ In egocentric space, the locations of objects are represented in egocentric terms – terms which are essentially relative to oneself. But these, as it were, representations of locations-from-a-point-of-view do not furnish identifications of an object in accordance with which it is found to be located at an *objective* location in the single, unified world order. Representing something egocentrically as, say, being *in front of me*, this is to say, does not, by itself, constitute locating it in this stronger, objective sense. Rather, if we are to be able to make use of an object in demonstrative thought – if we are to be able to individuate, identify, and reidentify it – then we must be able to locate the object in objective space (Evans, 1982: 150-152).

181, 209). Whilst it is not central to my analysis of Evans’s account, “*this*”-Ideas, so-construed, might indeed be thought important to the individuation, identification, and reidentification of objects for the purposes of demonstrative thought. The role of “*here*”-Ideas and “*I*”-Ideas, however, would seem less consequential in this regard. This, I suggest, is in part because of the immunity to error through misidentification as regards “*here*” and, as will be argued in section 6.2, as regards “*I*”. Further, it reflects the notion that the information-links regarding both “*here*” and (see section 6.2) “*I*”, need not be operative. Accordingly, to avoid unwieldiness, I have restricted my analysis of Evans’s account by speaking just of “*I*”-thoughts, “*here*”-thoughts, and “*this*”-thoughts, rather than making additional reference to the associated Ideas. I do not believe that this restriction serves to misrepresent those of Evans’s arguments to which I make reference in this chapter (nor, equivalently, in section 8.6).

³⁸ This characterisation of objective space (“*objective*” in the sense of its being “... *from no point of view*”) has certain resonances, I suggest, with the consideration of McTaggart’s complete description of reality in section 3.6.

How, though, might we come to locate an object or, indeed, a place, in objective space? According to Evans, our being able to locate an object in objective space, based upon a subjective perception, rests upon our being able to align, or to connect, objective space with our egocentric space, such that we might conform the respective locations of objects within them. Effecting this alignment requires that we deploy a so-called “*cognitive map*” (Evans, 1982: 151) – “cognitive map” being a label for our capacity to represent, independently of our own location, and at one fell swoop, multiple objective spatial relations obtaining between various distinct objects and places in the world (objective spatial relations such as, for example, the enduring distance and compass bearings relating the locations of two buildings). In thus coming to understand the objective spatial relations of the world apart from their own location in it, a subject is then able to lock that knowledge of the objective spatial relations onto their egocentric space, thus coming to “... to locate *[their] egocentric space in the framework of [the] cognitive map*” (Evans, 1982: 163). Having thus aligned their cognitive map with their egocentric space, Evans’s claim is then that, for a subject to locate an object in egocentric space, just is for them also to locate it in objective space. On this basis – on the basis of being able to locate an object in objective space – the subject is then, on Evans’s account, able to individuate, and to identify and reidentify, such an object, such that demonstrative thought about it becomes possible (Evans, 1982: 162-164, 174).

A further feature of Evans’s account which it is worthwhile to emphasise is that, as might be gleaned from the analysis above, egocentric space is not to be thought of as a “... *special kind of space*” but, rather, as merely a specification of space deploying “... *an egocentric... vocabulary*” (Evans, 1982: 157). In other words, egocentric space, and objective space, are not different spaces. Rather, they are *identical* – the two terms merely being two depictions of one and the same space.

Related to this identity of egocentric and objective space is a claim which Evans makes regarding *conscious experience*. Evans’s claim is that to merely inhabit an egocentric space, whilst sufficient for a subject to enjoy perceptions, some of which may involve associated actions, is, nevertheless, inadequate for conscious perceptual experience. This is because, whilst such actions are linked to the relevant sensory inputs, in a merely egocentric space the full informational content of the sensory inputs – in particular, the informational properties of the sensory inputs concerning the objective world at large – would not be accessible by the subject. And, Evans claims, if perceptual experience is to be raised to the level of *conscious* perceptual experience, then the subject’s thoughts and actions must be systematically dependent on these informational properties of the sensory inputs. In other words, they must be systematically dependent on the objective world. Perceptual experience, to be conscious

perceptual experience, thus involves both egocentric and objective considerations. More generally put, conscious perceptual experience of an objective world presupposes the numerical identity of egocentric space and objective space (an identity which, as noted, does indeed obtain in accordance with Evans's account) (Evans, 1982: 157-159).

6.2 ... and what he could have told us about time

Evans's account, then, involves what he terms "*egocentric space*", namely, that space, marked out in terms of the dimensions up/down, left/right and in-front/behind, at the point of origin of which a subject conceives themselves to be. This point of origin coincides with the location of the subject's point of view situated at what is, for them, their subjective "*here*" (Evans, 1982: 152-154, 156). And Evans's account also involves what he terms "*objective space*", i.e., that space marked out in terms of the objective, impersonal spatial relations obtaining between physical objects – relations which are "... *from no point of view*" (Evans, 1982: 152). Crucially (and necessarily, if conscious experience of an objective world is to be possible), egocentric space and objective space are identical – the two terms merely being two depictions of one and the same space. Thus, we can describe the self-same space both in terms of subjective coordinates, and in terms of objective, impartial coordinates. We can, that is, describe the self-same space both relative to an egocentric (or subjective) frame of reference, and also relative to an objective frame of reference.

Whilst they are presented as part of a wider, complex analysis of demonstrative identification, the specific claims which Evans is making about space are, I suggest, fairly intuitive and uncontroversial. The idea of compatible, and inter-translatable, mappings of the spatial world, in the one case relative to our own subjective location within it and, in the other case, in terms of the objective locations of worldly objects, is, I suggest, something embodied within our normal day-to-day experience of that world. And we would not, I suggest, other than in the sense that sometimes one will be more appropriate or more informative than the other, seek to privilege one of the frames of reference over the other – the two simply reflecting different ways of looking at the same thing.

What about, however, not the spatial domain, but the temporal domain? In chapter 4, the idea of objective and subjective *temporal* frames of reference has been suggested. The objective temporal frame of reference was said, in section 4.2, to be defined by the permanent B-relations of earlier-than and later-than in which events stand to one another. The subjective temporal frame was said, rather more loosely, to have as its point of origin a subject's moving

present. What I want to show in this and the next section is that it is plausible, via an extrapolation of Evans's analysis of the spatial domain, to develop these thoughts by deriving an account of the temporal domain which is, in many respects, equivalent to Evans's spatial analysis. In doing so, I will, equivalently to Evans's objective space, use the term "objective time" to refer to time as it is characterised in terms of the objective temporal frame of reference. Equivalently to Evans's egocentric space, I will use the term "subjective time" to refer to (one and the same) time as it is characterised in terms of the subjective temporal frame of reference.

How might we motivate an extrapolation of Evans's account into the temporal domain? Evans himself has no need to say very much, at least directly, about time. He does ascribe to us a conception of ourselves as "... *a persisting subject of experience, located in space and time*" (Evans, 1982: 232), one who knows "... *what is involved in locating oneself in a spatio-temporal map of the world*" (Evans, 1982: 211). He also observes that it is of the essence of an "*I*"-thought that it "... *effects an identification which spans past and present*" (Evans, 1982: 246). Further, he notes that, just as we shift from thoughts of "*here*" to thoughts of "*there*" in keeping track of a place whilst we are in motion, we similarly shift from thoughts of "*now*" to thoughts of "*then*" in keeping track of a time receding into the past (Evans, 1982: 237). But, beyond this, Evans's account remains very much focused on space to the exclusion of time.

Despite this, however, we can, I suggest, make a start in extending Evans's account into the temporal domain by recalling, from section 6.1, that he posits a local holism comprising the indexicals "*here*", and "*I*". As was seen, he also suggests that there obtains an interconnection between "*here*"-thoughts and "*I*"-thoughts, the two being "... *two sides of a single capacity, each wholly dependent upon the other*" (Evans, 1982: 256).

This idea of some sort of correspondence between "*here*"-thoughts and "*I*"-thoughts does, indeed, seem compelling. For example, it was noted in section 6.1 that "*here*"-thoughts are immune to error through misidentification. This suggests an equivalence between "*here*"-thoughts and "*I*"-thoughts, since it also seems plausible to claim, at a straightforward level, that the bearer of an "*I*"-thought does not go through a two-stage process of (to adapt the example in section 6.1) finding *someone* to be hot, to then have to infer that it is *they* who are that someone (*cf.* Evans, 1982: 216).

A further indication of immunity to error through misidentification in the case of "*I*" can be found in Evans's account of what he calls the "*cognitive dynamics*" of "*I*"-thinking (Evans, 1982: 237). A feature of the cognitive dynamics of "*I*"-thinking, Evans claims, is that a judgement of "*I am*

now F has a “*non-negligible probability*” of leading, in due course, to a disposition to judge: “*I was previously F*” (Evans, 1982: 237). Differently to “*this*”-thoughts about a normal physical object, this move from the first judgement to the second does not rest upon any capacity (or “*skill or care*”) on the part of the subject to keep track of the object of thought (Evans, 1982: 237). Rather, the later disposition simply spills out of the earlier one without any resources being expended on keeping tabs on what it is that is/ was *F*. And the ease of this essentially unmediated transition strongly suggests that the subject’s awareness of themselves as the bearer of the relevant “*I*”-thoughts is awareness on the basis of which such “*I*”-thoughts are immune to error through misidentification (Evans, 1982: 215-220; 237). Relatedly, and, again, equivalently with “*here*”-thoughts, Evans suggests that the information-links which might provide a subject with “... *information about [themselves]*” can, provided they obtain, nevertheless, lie dormant (Evans, 1982: 215-216). Overall, therefore, it can be seen, I suggest, that there is a considerable structural overlap between “*here*”-thoughts and “*I*”-thoughts.³⁹

What, though, does this imply as regards the temporal domain? What I first want to suggest in this regard is that, to Evans’s analysis of “*here*”-thoughts and “*I*”-thoughts can straightforwardly be added a temporal category of indexical thought, namely, “*now*”-thoughts. “*Now*”-thoughts are, I suggest, in relevant ways, structurally similar to “*here*”-thoughts and “*I*”-thoughts. For example, we have seen that “*here*”-thoughts and “*I*”-thoughts are immune to error through misidentification. And it seems highly plausible that this is also the case with “*now*”-thoughts: just as to feel *hotness* is to feel *oneself* to be hot *here*, it is also, surely, to feel *oneself* to be hot *here*, right *now*. A further commonality between “*I*”-thoughts, “*here*”-thoughts and “*now*”-thoughts is apparent in the critical role of “*now*”-thoughts in many instances of appropriate action. To take the example from Hugh Mellor referred to in section 4.2, if we are to be able, as we would wish, to turn on the radio news at 6.00pm, we need, not just to believe that the news is on at 6.00pm (we could have this belief all day), but also to believe that it is 6.00pm *now* (strictly, on Mellor’s account, we need also to “*get*” the “*now-belief*” that it is 6.00pm *now*) (Mellor, 1998: 64, 67). *When* we are, it might be put, matters just as much to

³⁹ This is not to deny, of course, that there are certain operative differences between “*here*”-thoughts and “*I*”-thoughts. Most obviously, with “*I*”-thoughts, there is only one object in play, namely, the “*I*” of self-reference. Moreover, “*I*”-thoughts can depend upon knowledge held in memories of our past states, in a way that “*here*”-thoughts cannot (Evans, 1982: 207). Despite these differences, however, “*I*”-thoughts and “*here*”-thoughts do, Evans concludes, have the “... *same general character*” (Evans, 1982: 205), both revealing “... *an element involving sensitivity... to certain information, and an element involving the way in which thoughts are manifested in action*” (Evans, 1982: 207).

appropriate action as does *who* we are or *where* we are. Evans, as has been said, posits a close link between action, “*here*”-thoughts, and “*I*”-thoughts. The intelligibility of this link, he notes, “... depends on there being a *harmony* between the thoughts and the behaviour to which a given sensory state gives rise” (Evans, 1982: 159). Given the importance of temporal awareness (in particular, of “*now*”-thoughts) to appropriate behaviours, Evans could straightforwardly, I believe, have explicitly added “*now*”-thoughts into this harmonious mix.

Indeed, still further similarities between “*here*”-thoughts, “*I*”-thoughts, and “*now*”-thoughts are apparent. We have seen, for example, that, the having of “*here*”-thoughts and “*I*”-thoughts” does not depend on the relevant information-links being open such that a subject is actually receiving information through those links. And Evans, I suggest, would surely have found the same to be the case with “*now*”-thoughts. Moreover, mention has been made, in the context of the “*I*”-thought “*I am now F*” flowing into the later “*I*”-thought “*I was previously F*”, of cognitive dynamics. Cognitive dynamics is the term which Evans uses to encapsulate “... *how a person’s belief system is organized to take account of the passage of time*” (Evans, 1982: 235). A further connection between “*now*”-thoughts (and, indeed, between time more generally) and “*I*”-thoughts is thus apparent. Indeed, it is becoming difficult to resist the conclusion that, to Evans’s local holism of “*here*” and “*I*” should also be added “*now*” – “*here*”-thoughts, “*I*”-thoughts, and “*now*”-thoughts being inter-defined; the intermeshing extending to all three. Evans tells us that we do not “... *first* have a clear conception of which object in the world we are..., and *then* go on to form a conception of what it is for us to be located at a particular place” (Evans, 1982: 153). Rather, as we have seen, “*I*”-thoughts and “*here*”-thoughts arise in tandem. And it is clear, I suggest, that “*now*”-thoughts are rightly to be regarded as a further element in this fusion.

6.3 The dimensions of the subjective temporal frame of reference

The analysis in sections 6.1 and 6.2, I believe, allows the notion of the subjective temporal frame of reference, as it was described in section 4.2, to be further refined. In section 4.2 (and also in section 6.2), it was said that the subjective temporal frame of reference has, as its point of origin, a subject’s moving present. Interestingly in this context, it has been seen in this chapter that Evans posits an egocentric (subjective) space, at the centre (or point of origin) of which a subject conceives themselves to be. This centre, or point of origin, is to be thought of as constituting the location of their point of view on the world, or their subjective “*here*” (Evans, 1982: 152-154, 156). As such, egocentric space plays a key role in the subject’s “*here*”-thoughts. As has also now been seen in section 6.2, there is a strong correspondence, and

an inter-relationship, between “*here*”-thoughts, and “*now*”-thoughts. And, given this, I suggest that the description of the point of origin of the subjective temporal frame can now be tightened up. This can be done by expressing it, not just as being a subject’s moving present, but as its being the temporal location in subjective time at which a subject conceives themselves to be, namely, the *temporal location of their point of view on the world* – a location which coincides with what can be characterised as their subjective “*now*”.

It has also been seen (section 6.2) that the coordinate systems of Evans’s egocentric space and objective space are inter-translatable (egocentric space and objective space being two descriptions of one and the same space). And the same notion seems naturally to apply to the coordinate systems of what I am calling subjective time and objective time (these two terms being two descriptions of one and the same time). Regarding objective time, the dimensions of the coordinate system relevant to the objective temporal frame of reference have been said to be (in sections 4.2 and 6.2) the objective, permanent B-relations of earlier-than and later-than. But what about subjective time? What are the dimensions of the subjective temporal frame of reference?

In considering this, it is worthwhile, first, to recall that, as was said in section 6.1, the dimensions of Evans’s egocentric space are up/down, left/right, and in-front/behind. These dimensions, I suggest, can be thought of in terms of their being the ways in which the objective spatial world is immediately presented to an experiencing subject, or as the ways in which that subject stands to that objective spatial world. Correspondingly, in the temporal case, how the world is immediately presented to us is, I suggest, first and foremost, as *present* (something which is allied to our subjective “*now*”). Since each instance of presentness is essentially fleeting, however, we have a sense also of other temporal locations (and of the events located at them) as having been present, or as yet to become present – in other words, of temporal locations and events which are past, or are future. Accordingly, we stand to the objective temporal world, and to the events which happen within it, in *impermanent temporal relations of futurity, presentness, and pastness*. And it is, therefore, these relations, I suggest, which constitute the dimensions of the subjective temporal frame. More fully put, the subjective temporal frame of reference is defined by the impermanent temporal relations of futurity, presentness, and pastness, in which events stand to an experiencing subject (in particular, stand to the temporal location of such a subject’s point of view, namely, their subjective “*now*”). This, therefore, serves to formalise the rather sketchy depiction of the subjective temporal frame of reference, based upon a subject’s scuttling moving present, which was set out in section 4.2. Crucially, however, it retains from that sketchy depiction the idea that events which, from the subject’s perspective (or, as it would now be put, events which, in relation to

the temporal location of the subject's point of view, or in relation to their subjective "*now*") were once-future events, become present events, and once-present events become past events. It also retains the idea from that depiction that the subjective temporal frame of reference, and the objective frame of reference, are in relative motion. Accordingly, it retains the idea that, relative to the subjective frame of reference, Change obtains. Relative to the objective frame of reference, however, it does not.

Talking of our standing to the objective temporal world in relations of futurity, presentness, and pastness suggests, I believe, a role for a temporal equivalent of Evans's cognitive maps. As was seen in section 6.1, cognitive maps underpin a subject's capacity to orientate objective space with egocentric space, thereby enabling the subject to locate an object in objective space. Indeed, this capacity, Evans tells us, amounts to the subject's being able to know what it would be for a location specified egocentrically to be identical with a location specified objectively (Evans, 1982: 163). Equivalently, I suggest, since the relations of futurity, presentness and pastness are relations in which we stand to the objective temporal world, we, thereby, equivalently, have a capacity to orientate locations in objective time with locations in subjective time (objective time, and subjective time, of course, being two descriptions of one and the same time). We thus have the capacity to conform the temporal way in which events stand to one another, with the way in which they stand to us. The importance of, in particular, "*now*"-thoughts in appropriate action (referred to in section 6.2) might be cited in support of our having such a capacity.

6.4 Concluding comments

A further point to arise from this analysis can be introduced by returning to the McTaggart quote in section 2.1, namely:

"The term *P* is earlier than the term *Q* if it is ever past while *Q* is present, or present while *Q* is future" (McTaggart, 1927: §610).

Earlier-than/ later-than can indeed be seen to be related to past/ present/ future in this way. But they are not straightforwardly interchangeable. I have suggested above (section 6.2) that the egocentric, and the objective, spatial coordinates are compatible, and inter-translatable. This, however, was, in fact, to gloss over the point that the egocentric spatial frame of reference, in contrast to the objective spatial frame of reference, needs a subject to bring it into being (a subject, that is, who can be located at the subjective "*here*"). And, in similar vein,

the subjective temporal frame of reference needs a subject to bring it into being (a subject, in this case, who can be located at the subjective “*now*”). Past/ present/ future, therefore, is dependent on a token-reflexive expression, or an indexical – namely, a “*now*” – in a way that earlier-than/ later-than is not (indeed, we have seen Bertrand Russell to say much the same in section 4.2 (Russell, 1915(a): 212)).

This thought elides with the thought that, whilst, in this chapter, the notion of a subjective temporal frame of reference has been more fully specified than was the case in chapter 4, and whilst, I believe, philosophical respectability has been brought to the idea that both subjective, and objective, frames of reference can legitimately and equivalently be applied to the temporal domain, this has all been said at what might be considered a somewhat abstract level. In particular, nothing has been said with regard to whether or not the subjective temporal frame of reference, and the subjective “*now*” at its point of origin, might be accorded metaphysical significance.

With this in mind, the next two chapters will adopt a similar structure. First, accounts of experiencing subjects will be analysed with a view to identifying those accounts which, it will be claimed, essentially involve metaphysically significant Change, and those accounts which do not. In chapter 7, these accounts of experiencing subjects will pertain to conscious perceptual experience and, in chapter 8, to personhood. Those accounts which do essentially involve metaphysically significant Change are, I will argue, as they are standardly presented, predicated on a world which is objectively A-theoretic, the metaphysically significant Change which they essentially involve being mind-independent, objective, absolute Change as it is presented in the A-theory. This thesis, however, based on the arguments of chapters 3 and 5, has proposed that the world is objectively B-theoretic, in the sense that it does not contain mind-independent, objective, absolute Change. The argument will then be made, however, that the metaphysically significant Change which is a prerequisite of certain accounts of experiencing subjects is to be secured, not through an appeal to a world which is objectively A-theoretic, but through an appeal to the metaphysical significance of the subjective temporal frame of reference. As some accounts of experiencing subjects will be said not to essentially involve metaphysically significant Change, this will also be to claim that the question of the metaphysical significance of Change is best considered alongside a consideration of the nature of the experiencing subject – something which suggests that the metaphysics of mind, and the metaphysics of time, are correlated.

I would mention one other point at this stage. In section 6.3, the objective temporal frame of reference has been said to be defined by the permanent temporal relations in which events

stand to one another, namely, the relations of earlier-than and later-than. The subjective temporal frame of reference, in contrast, is defined by the impermanent temporal relations of futurity, presentness, and pastness, in which events stand to the temporal location of an experiencing subject's point of view – to their subjective “*now*”. Interestingly, it was seen in section 3.2 that J.M.E. McTaggart suggests that, for Change to obtain (which, of course, he denies that it does), then it would have to be the case that events stood in the relations of futurity, presentness and pastness to an entity outside of the time-series. McTaggart himself had no need to identify this entity (McTaggart, 1927: §§327-328). However, the proposal regarding the subjective temporal frame of reference can be seen to identify this elusive entity with the successive subjective “*nows*”, corresponding to the temporal location of the experiencing subject's point of view, which the experiencing subject sequentially occupies – such “*nows*”, I will claim in the coming chapters, being, with reference to certain accounts of experiencing subjects, metaphysically significant. I will return to this topic in section 8.8.

7

Theories of perceptual experience and the subjective temporal frame of reference

Before moving on to the substance of this chapter, it will be helpful, I think, to take stock of what has been said thus far. Accordingly, I set out below a summary of the main claims and proposals of the thesis to date, as follows:

- I have used the term “Change” (with a capital “C”) to denote the movement in time of events from future to present to past.
- I have claimed that the notion of mind-independent, metaphysically real Change as it is presented in the A-theory is unpersuasive. This claim results from a consideration of certain arguments from philosophy (those made by J.M.E. McTaggart, and by Hugh Mellor) (sections 3.1 to 3.4), and of certain arguments from physics (the special and the general theories of relativity) (sections 5.1 to 5.5). Though immune to McTaggart’s argument, the version of the A-theory known as presentism was said to arguably face specific difficulties with regard to the truthmakers of past-tense sentences (section 3.5). Accordingly, I have proposed that the world, in not containing mind-independent, objective, absolute Change, is, in this sense, objectively B-theoretic.
- However, I have also suggested that the B-theory, and the arguments which tell against objective, absolute Change and thereby lend support to the B-theory, might not be such as to rule out metaphysically significant Change *tout court*. This is because, I have claimed, the question of the metaphysical significance of Change is best considered alongside a consideration of the nature of the experiencing subject (sections 3.6 and 4.3). This is also to suggest that the metaphysics of mind, and the metaphysics of time, are correlated.
- I have presented arguments to demonstrate that, in his depiction of time in relativity theory, Albert Einstein is not seeking to provide a rigorous, and autonomous, description of time, nor to rigorously delimit the characterisation of time as it might be stated from the perspective of metaphysical reality. Accordingly, whilst relativity theory denies objective, absolute Change as it is presented in the A-theory, it need not be

thought to rule out the notion of metaphysically significant Change obtaining relative to a particular frame of reference (sections 5.6 to 5.9).

- I have proposed that, in addition to the objective temporal frame of reference of the B-theorist and the physicist – a frame of reference defined by the permanent B-relations of earlier-than and later-than in which events stand to one another – consideration is also due of a *subjective* temporal frame of reference. Whilst Change does not obtain relative to the objective temporal frame of reference, relative to the subjective temporal frame of reference it does. And, I have suggested (though without justification so far), that, with reference to some, though not all, accounts of experiencing subjects, the Change which obtains relative to the subjective temporal frame of reference is to be accorded metaphysical significance (sections 4.1 to 4.3).
- Given the proposal of a subjective temporal frame of reference, the notion that a single domain, such as the temporal domain can, legitimately and equivalently, be described by an objective, and by a subjective, frame of reference has required justification. I have justified this notion, first, by outlining Gareth Evans's account of demonstrative identification – such account involving both an objective, and a subjective, frame of reference as regards the *spatial* domain (section 6.1). Support for the proposal as regards the temporal domain then came from an extrapolation of Evans's methodology, as regards the spatial domain, into the temporal domain (sections 6.2 to 6.3).
- Following the analysis and extrapolation of Evans's account, it has been said that the proposed subjective temporal frame of reference is defined by the impermanent temporal relations of futurity, presentness and pastness in which events stand to an experiencing subject (in particular, stand to the temporal location of that subject's point of view, namely, their subjective "*now*", situated at the point of origin of the subjective temporal frame of reference) (section 6.3).
- I have proposed that the elusive entity to which, were Change to obtain, McTaggart suggests events would stand in relations of futurity, presentness, and pastness, is to be identified with the successive subjective "*nows*" which the experiencing subject sequentially occupies (sections 3.2 and 6.4).

As indicated above, however, an important step remains to be taken. Whilst the analysis summarised above has, I believe, brought philosophical respectability to the notion of the subjective temporal frame of reference, it has left open the question of what taxological ranking might be attributed to it. Might the subjective temporal frame of reference be of interest, for example, only at an abstract level or, at most, as the B-theorist would suggest, at a

psychological level? Or can it be claimed, at least with reference to some, if not to all, accounts of experiencing subjects, that the subjective temporal frame of reference, and the Change which obtains relative to it, are to be accorded metaphysical significance? With this in mind, Chapter 8 will comprise an analysis of certain accounts of *persons*. In this chapter, however, I seek to assess the metaphysical significance of the subjective temporal frame of reference with reference to certain theories of *conscious perceptual experience*. Section 7.1 comprises a description of two such theories – namely, *direct realism*, and *representationalism*. In sections 7.4 and 7.5, I argue that conscious perceptual experience, as it is characterised by the direct realist, but not as it is characterised by the representationalist, essentially involves metaphysically significant Change. Section 7.6 then defends the claim that, in a world which is, as I propose, objectively B-theoretic, the metaphysically significant Change which direct realism essentially involves is secured through the metaphysical significance of the subjective temporal frame of reference. Since it has been said that representationalism does not essentially involve metaphysically significant Change, this does, therefore, support the claim that, with reference to some, though not all, accounts of experiencing subjects, the subjective temporal frame of reference, and the Change which obtains relative to it, are, indeed, to be accorded metaphysical significance. This will further be said to support the claim from chapters 3 and 4 that the question of the metaphysical significance of Change is best considered alongside a consideration of the nature of the experiencing subject

Part 1 – Theories of perceptual experience

7.1 Direct realism and representationalism

In the history of philosophy, many theories have been proposed with the aim of explaining our experience – in particular, our *conscious perceptual experience*. Such theories have included sense-datum theories, and a theory known as adverbialism, though, in recent times, both of these have largely fallen out of favour. In this chapter, I will therefore focus on just two theories of perceptual experience, namely, *direct realism*, and, to a lesser extent, *representationalism* – these two theories being those which currently garner the most support amongst contemporary philosophers.

To consider, first, *direct realism*.⁴⁰ Direct realism reflects what is, perhaps, a typical pre-theoretical understanding of perceptual experience. For example, it embodies what Tim Crane and Craig French term “*direct realist presentation*”, whereby:

“... perceptual experiences are *direct perceptual presentations of ordinary objects*”
(Crane and French, 2021: §1.4).

What is meant here by “*ordinary objects*” is objects which are mind-independent, and which include both material objects and other entities such as events (Crane and French, 2021: §1.2). On the assumption that the direct perceptual presentation of such ordinary objects comprises a way of directly perceiving those objects, this then amounts to the (intuitive) claim at the heart of direct realism, namely, that we can directly perceive ordinary objects.

In claiming that perceptual experiences are direct perceptual presentations of mind-independent objects, direct realism can be seen to be ascribing perceptual experience a *relational nature*. In particular, direct realism appeals to a distinctive psychological relation of conscious acquaintance in which, it is claimed, an experiencing subject stands to mind-independent objects and their properties when undergoing conscious perceptual experience. And, since mind-independent objects can be directly perceived, it follows that these objects, and their properties, are constitutive of a perceptual experience’s manifest phenomenal character (French, 2018: 150-151). This is to say, it is the features of the mind-independent world to which we stand in the distinctive conscious perceptual relation which constitutively “... *shape the contours of the subject’s conscious experience*” (Martin, 2004: 64). The phenomenal character of a perceptual experience is thus explained by the actual instance of (say) an *F*-type object manifesting itself in experience. Things appear a certain way to us because we are being directly presented with aspects of the external world (Crane and French, 2021: §3.4.1; Soteriou, 2013: 84-85, 87-88, 99).

However, according to the main current rival to direct realism, namely, *representationalism*, things are markedly different. To put the difference somewhat crudely, according to direct realism, as has been said above, we are directly presented with mind-independent objects. According to representationalism, however, experience perceptually *represents* such objects. And experience perceptually represents such objects by involving an experiencing subject in the instantiation of certain representational brain states (Gendler and Hawthorne, 2006: 17).

⁴⁰ What I am calling *direct realism* could equally be called *naïve realism*. In the context of this thesis I am not seeking to suggest any significant distinctions between these two descriptions.

Representationalism thus makes an appeal to the distinctive properties of the mental events and states which obtain when a subject undergoes conscious perceptual experience. In particular, conscious perceptual experiences are held to be personal-level mental events and states with representational properties – such representational properties to be understood on the basis that conscious perceptual experiences have intentional contents with veridicality conditions (Soteriou, 2013: 84-85).⁴¹ As part of this account, it is also generally claimed by the representationalist that a *causal analysis* can be given of the instantiation of the representational brain states, such states being taken to be causally correlated with external states of affairs (Campbell, 2002: 145-146). What we would pre-theoretically class as an experience of an *F*-type object thus amounts, on the representationalist account, to experience perceptually representing the presence of an *F*-type object, the associated representational brain state being caused by (strictly, *non-deviantly* caused by) the *F*-type object in question (Crane and French, 2021: §3.3.5; Soteriou, 2013: 85).

As regards the representationalist account of the manifest phenomenal character of perceptual experience, an experiencing subject's phenomenal state is held to be shaped, not (as with direct realism) by the way the subject's surroundings are but, rather, by the posited intentional representational mental events and states, and the distinctive properties of those events and states (Campbell, 2002: 116; Soteriou, 2013: 85, 87). For the representationalist, therefore, experience represents things in a certain way, and the phenomenal character of experience is explained by the specific way in which it does so (Crane and French, 2021: §3.3.1).

It can be seen, therefore, that direct realism, and representationalism, offer quite different assessments of our perceptual experience. John Campbell, who provides an account consistent with direct realism, seeks to encapsulate the differences by saying that, in terms of direct realism, our experience, both of mind-independent objects and of their properties, is “... *experience of the categorical*”, meaning that an experiencing subject is, via perception, able to acquire knowledge of the intrinsic character of objects, and of their properties (Campbell, 2002: 137). In terms of representationalism, however, experience, Campbell suggests, represents objects as functional connections, and the properties of objects as complexes of dispositional characteristics. In consequence, experience, rather than introducing us to the

⁴¹ Since the posited representational brain states are accorded an *intentional* aspect – perceptual experiences being held to be representational states about, or directed upon, the world – representationalism is also known as *intentionalism* (Martin, 2006: 355).

intrinsic character of perceived objects, represents the world at a level of functional isomorphism (Campbell, 2002: 137, 147-150; Soteriou, 2016: 93). These differences will be returned to in section 7.5.

7.2 Hallucinations, illusions, and disjunctivism

7.2.1 Introduction to hallucinations and illusions

The difference in the assessments of our perceptual experience offered by direct realism and representationalism can also be seen in their very different accounts of one particular aspect of our experience – namely, experience which is *illusory*, or *hallucinatory*. What is meant by these terms is that, whereas, in the case of a veridical perception, a subject perceives an object as it really is, in the case of an *illusion* the subject perceives an object differently to how it really is and, in the case of a *hallucination*, the subject does not actually perceive any object at all (even though they do have an experience in some sense akin to a perceptual experience of an actual object) (Soteriou, 2016: 1). For the representationalist, accommodating our illusory and hallucinatory experience is a relatively straightforward matter. This is because the representationalist can endorse what Michael Martin calls the “*Common Kind Assumption*”, namely, that:

“... whatever kind of mental event occurs when one is veridically perceiving some scene, such as the street scene outside my window, that kind of event can occur whether or not one is perceiving” (Martin, 2004: 40; *cf.* Martin, 2006: 357).

This is to say, whatever kind of representational brain state occurs when a subject enjoys a veridical perception, then, according to the representationalist, the very same kind of representational brain state can occur in circumstances where the subject is, instead, undergoing a hallucination (and, similarly, as regards an illusion). Accordingly, veridical, hallucinatory, and illusory experiences (as) of an *F*-type object have the same fundamental nature (form a *common kind*) because, in each case, the world is represented as being a certain way in virtue of the instantiation of a representational brain state (Crane and French, 2021: §1.6, §3.3.1, §3.4.3).

7.2.2 Introduction to disjunctivism

The Common Kind Assumption, which the representationalist endorses, does, indeed, seem intuitively plausible. After all, hallucinations (for example) must be introspectively indiscriminable from veridical perceptual experiences, and have the same psychological effects as veridical perceptual experiences, as, otherwise, we wouldn't be deceived by them. Hence, the notion, endorsed by the representationalist, that veridical, illusory, and hallucinatory experiences share a common fundamental nature does, instinctively, seem well founded.

This, however, presents a difficulty for the direct realist. This is because, if the direct realist is going to be able to accommodate hallucinations and illusions in their account, then, rather than endorsing the intuitively plausible Common Kind Assumption, they are, instead, going to have to *deny* it. That this is so can be easily seen. As has been said, in (say) hallucinatory experience, a subject does not actually perceive an object in their environment (however it might seem to them). Accordingly, in hallucinatory experience, the subject is not *directly presented* with an ordinary object. If the Common Kind Assumption is correct, then the same account of experience must apply to veridical experiences as applies to hallucinatory experiences. So, if we are not directly presented with ordinary objects in hallucinatory experience, then we are not directly presented with ordinary objects in veridical experience, either. Now, if we are not directly presented with ordinary objects even in veridical perceptual experience, it seems most unlikely that we are *ever* directly presented with ordinary objects. In which case, whither direct realism? The whole plausibility of direct realism seems to have been brought into doubt (Crane and French, 2021: §2.2).

How might the direct realist seek to restore plausibility to their theory? They cannot outright deny that the veridical perception of an *F*-type object, and the illusion or hallucination of an *F*-type object, are all introspectively indiscriminable, and have the same psychological effects. After all, as has just been said, it is the fact that any illusion or hallucination worthy of the name is introspectively indiscriminable from veridical perception that lends the Common Kind Assumption its intuitive credentials. However, whilst accepting this indiscriminability, what the direct realist can claim, *contra* the representationalist, is that the indiscriminability does not arise in virtue of the truth of the Common Kind Assumption. Rather, the direct realist can endorse what, following J.M. Hinton (Hinton, 1967: 219), can be thought of as a *disjunctivist* account of experience, whereby an experience is *either* a genuine perception of an *F* *or* it is a mere illusion or hallucination *as of* an *F*. As Paul Snowdon formalises this approach:

“...it looks to [subject] *S* as if there is an *F* [is, in terms of the disjunctivist account, to be taken as meaning that]:

“... [either] (there is something which looks to *S* to be *F*) [or] (it is to *S* as if there is something which looks to him (*S*) to be *F*)” (Snowdon, 1980-1981: 185).

At first sight, adopting this disjunctivist approach might not seem to be bringing much to the debate. But the crucial claim underpinning disjunctivism is the claim that the two disjuncts, however it might seem to the subject in question, correspond to perceptual experiences with *different fundamental natures*. Accordingly, the type of conscious perceptual experience that you have when you perceive your environment veridically is not (and, indeed, never could be) the same type of conscious perceptual experience as you would be having when (say) hallucinating (Soteriou, 2016: 183). As Martin expresses this on behalf of the direct realist who endorses disjunctivism:

“On [the direct realist] conception of experience, when one is veridically perceiving the objects of perception are constituents of the experiential episode. The given [mental] event could not have occurred without these entities existing and being constituents of it; in turn, one could not have had such a kind of event without there being relevant candidate objects of perception to be apprehended. ...[The] objects are implicated in the causes of the experience, ...[and] they also figure non-causally as essential constituents of it.... [The] absence [of the objects] is sufficient for the non-occurrence of [the given mental] event” (Martin, 2004: 56-57).

This is to claim, therefore, that there is nothing intrinsic in common between a veridical perception of (say) a dagger, and a hallucination of a dagger. As Campbell straightforwardly makes the point:

“In the case in which there is a dagger, the object itself is a constituent of your experience. The experience is quite different in the case of the hallucination, since there is no object to be a constituent of your experience” (Campbell, 2002: 117).

Accordingly, we can take it that, for both Martin and Campbell, part of the disjunctivist claim rests on there being some *specific phenomenal character* which obtains in the case of, and only in the case of, veridical perception.

7.2.3 Defending disjunctivism

In accounting for illusions and hallucinations, then, the direct realist is obliged to invoke disjunctivism, and to thereby claim, whilst accepting the introspective indiscriminability of illusory and hallucinatory experiences from veridical experiences, that illusory and hallucinatory experiences nevertheless have a different fundamental nature from veridical experiences. They thus deny the Common Kind Assumption and can, therefore, continue to maintain that, at least in the case of veridical perception, a subject is directly presented with mind-independent objects. However, if disjunctivism (and, with it, the plausibility of direct realism) are to be defended, I suggest that two key questions need to be addressed, as follows:

- If a hallucinatory experience is introspectively indiscriminable from a corresponding veridical experience, then in what sense can the two experiences have a different fundamental nature?
- If a hallucinatory experience is introspectively indiscriminable from a corresponding veridical experience, then what is the role of the specific phenomenal character, posited by Martin and Campbell, as obtaining in the case of, and only in the case of, veridical perception?

Further, in answering these questions, the notion that the hallucinations and illusions under consideration are phenomenally conscious will need to be retained. This will ensure that such hallucinations and illusions cannot be ascribed to, for example, philosophical zombies (beings which lack phenomenal consciousness). As Martin puts it:

“Since it is commonly taken to show that a theory is inadequate as an account of phenomenal consciousness if it could equally be true of a philosophical zombie, it would seem to be a failing in the disjunctivist account if it ends up claiming that in cases of hallucination we are no better off than such mythical beings” (Martin, 2006: 378).

To take the second of the two questions first, the point at issue, put simply, is that if hallucinatory experience is introspectively indiscriminable from veridical experience, then what is brought to the party by the mooted *specific phenomenal character* said to obtain just in the case of veridical perception (see section 7.2.2)? To consider the point more specifically, take the case of a “*causally matching hallucination*” (Martin, 2004: 54). A causally matching hallucination, in addition to being introspectively indiscriminable from a veridical perception, also has the same kind of proximate cause as would the veridical perception. Accordingly, it

would seem to follow, for example, that the properties associated with the event of having the hallucinatory experience, and the properties associated with the event of having the veridical experience – the properties, in particular, which explain why the experience in question “... *is as it is and has the [behavioural] consequences that it does*” (Martin, 2004: 71) – would be the same in both cases (since how the experience is, and its consequences, are the same in both cases). On which basis, what is the explanatory value of the mooted specific phenomenal character as regards why the experience in question is as it is, and why it has the consequences that it does? Any explanatory value which it might have had in this regard would appear to be entirely redundant (Martin, 2004: 53-71). Martin, who provides perhaps the most comprehensive defence of disjunctivism against the issues created by hallucinations, refers to this apparent redundancy as the “... *problem to do with screening off*” (Martin, 2004: 69).⁴²

Martin’s response to this is to say that the concern regarding screening off only arises if a “*positive characterisation*” of causally matching hallucinations is deployed (Martin, 2004: 71). Such a positive characterisation might involve a *non-derivative* account of causally matching hallucinations, in terms of which such hallucinations are accorded a positive nature that does not derive from the nature of a veridical perception and which can, in consequence, be specified independently of any reference to veridical perception. For example, on a positive account, a causally matching hallucination might be positively characterised as a representation of a mind-independent object, just as the representationalist would suggest.

Martin’s claim, however, is that this is the wrong way to look at causally matching hallucinations. As such, he rejects positive, non-derivative characterisations of them. Rather, he claims, the phenomenal character of causally matching hallucinations is to be characterised *derivatively* – in terms, that is, of the specific phenomenal character that is distinctive of veridical perception, and which a hallucination seems to have but, in fact, lacks. This then leads into a characterisation of causally matching hallucinations expressed in a purely negative epistemic way – namely, in terms of the inability of experiencing subjects to know via introspection that such a hallucination is not a veridical perception. As such, causally matching hallucinations possess the “*negative epistemological property*” of being introspectively indiscriminable in this way (Martin, 2006: 378). The possession of this property Martin refers to as a “*negative epistemological condition*” (Martin, 2006: 378).

⁴² This section has benefited from a consideration of Matthew Soteriou’s analysis of Martin’s arguments (Soteriou, 2016: 158-184).

How might this address the problem of screening off? Martin is saying that, in the case of a causally matching hallucination, the phenomenal character of the experience a subject has is exhausted by that experience's possession of the negative epistemological property of being introspectively indiscriminable from a veridical perception. Accordingly, causally matching hallucinations are to be characterised *derivatively*, since specifying their nature requires essential reference to veridical perception. As such, any explanatory role assigned to the phenomenal character of a causally matching hallucination is parasitic on the distinctive explanatory role that, on the direct realist account, only veridical perception can possess (in virtue of its specific phenomenal character). And, since the effects of a hallucination are to be explained in terms of the phenomenal character of the veridical perception from which the hallucination is introspectively indiscriminable, the explanatory role assigned to the specific phenomenal character of veridical perception is not screened off, or rendered explanatorily redundant, after all (Martin, 2004: 68-71; Martin, 2006: 369; Soteriou, 2016: 170, 182).

On this basis, Martin does, I believe, provide a plausible account of how disjunctivism might survive the threat posed by the potential problem of screening off and, in doing so, deals with the second of the two questions posed above. Accordingly, I will now turn to the first question, namely, the question as to how, on a disjunctivist account, hallucinatory experience is said to be introspectively indiscriminable from veridical experience whilst, nevertheless, having a different fundamental nature from it. To this end, we have seen that, on Martin's derivative account, the phenomenal character of causally matching hallucinations is to be characterised in terms of the specific phenomenal character that is distinctive of veridical perception and which a hallucination seems to have but, in fact, lacks. As has been said, the hallucination, and the veridical perception, are introspectively indiscriminable, but it might be noticed that Martin's derivative account does not attribute this indiscriminability to the hallucination's, and the veridical perception's, having the same phenomenal character. Indeed, the implication is that they do *not* have the same phenomenal character. Hence, in keeping with Martin's account, we need not think that a hallucinatory experience, and a veridical experience, are qualitatively alike in the sense of having all of their introspectable phenomenal properties in common. Rather, following Hinton (Hinton, 1967: 225-226), we can posit that they merely *seem to have* all of their introspectable phenomenal properties in common. The indiscriminability of the hallucinatory experience and the veridical experience, then, does not result from introspection yielding an awareness of one and the same overall collection of phenomenal properties in both cases. Rather, it merely *seems* to the subject that, in introspecting what is in fact a hallucinatory perceptual state, an awareness comes about of those phenomenal properties which pertain to the corresponding veridical perceptual state (Soteriou, 2016: 177). This analysis, of course, is at variance with the Common Kind

Assumption, which was said in section 7.2.2 to be intuitively plausible. But, I suggest, this is not to say that a commonsensical interpretation cannot be placed upon this Hintonian view, too. In terms of the Common Kind Assumption, we could say that a subject seems to perceive an *F*-type object (even though they don't); this is because they have an experience introspectively indiscriminable from a corresponding perceptual veridical experience. In terms of the Hintonian assumption, in contrast, a subject seems to perceive an *F*-type object (even though they don't); this is because they seem to have an experience involving the same introspectable properties as would a corresponding veridical perceptual experience (even though they don't). Indeed, faced with a choice, it might well be that the Hintonian version would find the most favour, commonsensically speaking.

To come to the final concern noted above, it is important that, in giving the above answers to the two key questions, we have not undermined the notion that the hallucinations and illusions under consideration are phenomenally conscious. As noted, the threat to this notion stems from so-called philosophical zombies which lack phenomenally conscious states. Nevertheless, when a zombie hallucinates, it might be claimed that it is in the position of having an experience which is introspectively indiscriminable from a veridical perception. This is because, whilst lacking phenomenal consciousness, the zombie, when hallucinating, is, we can assume, in a perceptual state that plays a certain type of functional role which is to be specified in terms of its typical causes, and its cognitive and behavioural effects (indeed, the zombie will in this sense be functionally similar to a subject who does possess phenomenal consciousness). These cognitive and behavioural effects of the zombie's perceptual state will not provide it with any knowledge to the effect that the state does not arise from a veridical perception. As such, the hallucination cannot be distinguished from a veridical perception. In which case, it would appear that Martin's negative epistemological condition of introspective indiscriminability has been met – but has been met in a situation completely lacking in anything by way of phenomenal consciousness (Martin, 2004: 82-85; Martin, 2006: 378-379; Soteriou, 2016: 171-172). (An argument to this effect is presented by Susanna Siegel (Siegel, 2004: 93-98).)

In fact, however, Martin can demonstrate that this argument serves (impossibly, *ex hypothesi*) to attribute phenomenal consciousness to the zombie. The cognitive and behavioural effects arising from the zombie's perceptual state are, he can claim, not sufficient to determine whether or not the negative epistemological condition has been met. This is because, on Martin's account, the cognitive and behavioural effects arise only because the subject is undergoing an experience which is introspectively indiscriminable from a corresponding veridical perception. Hence, in line with Martin's more general claim regarding the derivative

nature of hallucination, the cognitive and behavioural effects are to be explained by reference to the distinctive explanatory role assigned to the specific *phenomenal* character of veridical perception. Since such phenomenal character is unavailable to the zombie, the negative epistemological condition cannot, therefore, be satisfied by the zombie (Martin, 2004: 82-85; Martin, 2006: 378-379; Soteriou, 2016: 171-172).⁴³

7.3 Conclusion to Part 1

The analysis of hallucinations and illusions in section 7.2 has largely concentrated on causally matching hallucinations. This is because I consider causally matching hallucinations to constitute the most difficult cases for the disjunctivist account to accommodate. Accordingly, if, as I believe has been demonstrated, the disjunctivist can mount a successful defence in the case of causally matching hallucinations, then it is to be expected that a successful defence could also be mounted in the cases of hallucinations which are not causally matching, and also in cases of illusions. Hence, whilst it has not been the intention in this Part 1 to provide a comprehensive defence of disjunctivism on behalf of the direct realist, I consider that enough has been said to show that direct realism which incorporates disjunctivism can be regarded as, at least, a plausible account of experience.

Part 2 – Perceptual experience and our contact with time

7.4 Perceptual experience and Change

It is not just with regard to the general character of our perceptual experience that direct realism and representationalism reach different conclusions. They also have different implications for what might be thought of as an experiencing subject's contact with time and, connectedly, for Change. It is to these temporal considerations which I will now turn.

⁴³ Indeed, in terms of Martin's overall account, the negative epistemological condition can never be satisfied in the absence of phenomenal consciousness. This is because the introspection involved in satisfying the negative epistemological condition serves, Martin tells us, to specify an experiencing subject's perspective, or point of view, on the world. And, crucially, on Martin's account, to have a point of view on the world is to have phenomenally conscious experience of that world. Hence, satisfying the negative epistemological condition necessarily involves phenomenal consciousness (Martin, 2006: 378, 394). I will return to this topic in section 7.5.

The issue of time in the context of direct realism is explicitly addressed in the direct realist account provided by Matthew Soteriou, an account which includes what Soteriou terms our “... *conscious contact with time*” (Soteriou, 2013: 135). In relation to time, Soteriou posits two phenomenological claims with regard to a subject’s introspection of their conscious perceptual experience. One such claim he terms the “*positive phenomenological claim*” (Soteriou, 2013: 90), the key feature of which for current purposes is the idea that a subject’s introspection of their perceptual experience can reveal, in addition to mind-independent objects and their properties, temporally-extended worldly events which unfold over time (Soteriou, 2013: 89-90). The second phenomenological claim – the “*negative phenomenological claim*” (Soteriou, 2013: 90) – concerns what Soteriou terms the “*temporal transparency*” of experience (Soteriou, 2013: 90, 91). What is meant by temporal transparency is that, in perceiving (say) an unfolding worldly event, a subject’s experience seems to share the temporal location and duration of that event. Furthermore, this is also the case at the level of constituent temporal sub-intervals – the temporal sub-intervals of the subject’s experience seeming to share the temporal location and duration of the temporal sub-intervals of the worldly event. As such, the subject cannot, in introspection, differentiate between the temporal location and duration of a perceptual experience, and the temporal location and duration of what it is that they are perceptually aware of (Soteriou, 2013: 89-94, 140-141).

Soteriou’s account also involves what he terms the “*temporal sensory field*” (Soteriou, 2013: 123). It has been said in section 7.1 that, according to direct realism, the phenomenally conscious state of an experiencing subject is to be characterised in terms of the obtaining of a distinctive conscious perceptual relation. More particularly, it is the mind-independent objects, and their properties, to which the subject stands in this relation that are constitutive of the manifest phenomenal character of perceptual experience. But the direct realist need not claim that the manifest phenomenal character of perceptual experience is *entirely* constituted by the mind-independent objects, and their properties (they need not, this is to say, claim that perceptual experience is “*diaphanous*” (Moore, 1903: 450)). And Soteriou makes the (non-diaphanous) claim that it is not only the mind-independent objects, and their properties, which shape the manifest phenomenal character of perceptual experience. Rather, certain aspects of the distinctive conscious perceptual relation itself also have a role in the shaping of this manifest phenomenal character – the relation, on this basis, not being completely passive in its mode of operation. In particular, according to Soteriou, the distinctive conscious perceptual relation has a role in the shaping of the phenomenal character of experience in virtue of its evincing what he calls certain “*structural features*” (Soteriou, 2013: 3) – one such structural feature being the posited temporal sensory field (Soteriou, 2013: 3, 13-14, 115, 122-123).

How might this temporal sensory field serve to shape the manifest phenomenal character of perceptual experience? On Soteriou's account, the notion of the temporal sensory field captures the idea that mind-independent objects are not only "*space-occupying*" objects, but are also "*time-occupying*" objects (Soteriou, 2013: 120, 124). And, Soteriou claims, because objects are time-occupying, our experiential awareness of them involves a temporal interval (i.e., a temporal sensory field) within which those objects are temporally located. More particularly, those entities which an experiencing subject is perceptually aware of are perceived by that subject as occupying an interval of time which coincides with, or falls within, the temporal sensory field of their conscious experience. The temporal sensory field – the interval of time within which we are aware of experienced mind-independent objects as being located – thus constitutes an aspect of the manner in which we are psychologically related to those objects. In this sense, then, the temporal sensory field is a structural feature of the distinctive conscious perceptual relation, playing a part in the shaping of the phenomenal character of perceptual experience (Soteriou, 2013: 124-130).

It is also relevant to consider Soteriou's account more generally. Soteriou characterises perceptual experience in terms of a phenomenally conscious mental event or process, together with an associated phenomenally conscious mental state. More fully put, the occurrence of the phenomenally conscious mental event or process involves the experiencing subject's being in a phenomenally conscious mental state which is constitutively dependent on, and is sustained by, the mental event or process. Crucially, however, mental events and processes are, in turn, constitutively dependent upon mental states – a mental event or process of the relevant kind not being able to occur without the obtaining of a mental state. The events or processes, and the states, are, therefore, *interdependent*. As Soteriou sets out his "*interdependence thesis*" (Soteriou, 2013: 50-51):

“... the occurrence [i.e., the mental event or process] and [mental] state in question have an interdependent status, in so far as the nature of the occurrence is to be specified, at least in part, in terms of the kind of state that obtains when it occurs, and the nature of the state is to be specified, at least in part, in terms of the kind of occurrence that its obtaining is constitutively dependent on” (Soteriou, 2013: 249).

On this basis, an experiencing subject who is experiencing an unfolding worldly event is to be attributed a phenomenally conscious mental state, the obtaining of which will appear to the subject to be dependent on the occurrence of a phenomenally conscious mental event or process. It will also seem to the subject that the mental state depends on the obtaining of the posited distinctive conscious perceptual relation which will, in turn, depend on the occurrence

of the worldly event. Since the worldly event is temporally extended over a certain interval of time, this is to say that the obtaining of the subject's mental state over that interval of time will seem to the subject to depend on the occurrence of something that takes that interval of time to occur (Soteriou, 2013: 101).

What is of particular importance to this depiction is the fact that the mental event or process, and the mental state, whilst they are interdependent, and whilst they are both temporally-extended, do not denote the unfolding worldly event in the same way. This is because, whereas the mental event or process can rightly be said to *unfold* over time (as does the worldly event), mental states, in contrast, are not the sorts of thing which unfold in this sense. Rather, temporally-extended mental states *occupy* intervals of time, *en bloc*. As such, they are not, as Soteriou puts it, "... *homogeneous down to instants*" (Soteriou, 2013: 102). And, given this, if a subject is in a particular mental state over an interval of time, this should not be taken to mean that the mental state obtains at each of the instants that make up that interval of time. Rather, the subject can only be said to be in a mental state at a particular instant of time in the sense that the mental state obtains *over an interval of time that includes that particular instant*. Accordingly, rather than its seeming to the subject that a mental state unfurls across an interval of time, the phenomenology will be that of being aware of something that fills, or suffuses, an interval of time over that interval of time.

This analysis can helpfully be compared with the act of *judging* (Soteriou, 2013: 246ff.). An act of judging that *p* (this act, in the analogy, standing in for the mental state) is temporally extended, but the interval of time which it fills cannot be meaningfully divided into temporal sub-intervals, each corresponding to a part of content *p*. But the mental events sustaining the act of judging (and fashioning the subject's mental life) have temporal extensions which do incorporate temporal sub-intervals. Hence, whilst the mental events constitute the "*vehicles*" (Soteriou, 2013: 248) of the conscious mental act of judging, they do not impose their temporal profile upon that act of judging (they do not force an architecture of temporal sub-intervals upon that act and, in particular, their temporal sub-intervals do not serve to determine any component parts of the content (*p*) of the judging). And, equivalently, the mental events and processes involved in conscious perceptual experience of worldly events are the vehicles of the relevant mental states, yet have a different temporal complexion to those mental states (i.e., they have temporal extensions incorporating temporal sub-intervals, whereas the mental states are temporally extended but without determinable temporal sub-intervals which might correspond to component parts of the worldly event in question). Accordingly, in the case of conscious perceptual experience, a subject is aware, in virtue of the relevant mental state, of a (whole) worldly event with, say, temporal extension t_1 - t_n . But, in terms of the mental event

or process sustaining that mental state, the subject has an awareness of the worldly event which is more animated – an awareness in keeping with that worldly event's own unfolding across time. And what binds this arrangement together is the distinctive conscious perceptual relation in which the subject stands to the overall worldly event throughout t_1 - t_n , and on which, as noted above, the obtaining of the mental state depends (Soteriou, 2013: 94-95, 98, 101-102, 106, 140-144, 246-251).

This analysis also has implications for the way in which an experiencing subject might experience Change. First, in the previous paragraph, the experiencing subject has been attributed an awareness of an overall worldly event's occupying a temporal interval t_1 - t_n , together with an awareness that there is a difference in what is experienced during different sub-intervals of t_1 - t_n . In this sense, the different temporal characters of, respectively, mental states, and mental events and processes, can be said to collude in the presentation of some kind of ineluctable, and insistent, onward march. More particularly, however, we have seen that, on Soteriou's account, the entities which a subject is perceptually aware of are experienced as being within an interval of time equivalent to the subject's temporal sensory field. On the assumption of temporal transparency, everything that the subject is perceptually aware of seems to that subject to be concurrent with their awareness of it. Accordingly, we can take it that whatever the subject is perceptually aware of is experienced as occupying an interval of time that is temporally "*present*". The interval of time will contain sub-intervals, which will also seem to the subject to be concurrent with their awareness of it, and which will also, therefore, seem to the subject to be temporally "*present*". And, crucially, Soteriou claims that the sub-intervals of time will seem to the subject to be *successive* – at least in the sense that it will seem to the subject that to be perceptually aware of the entirety of the interval (i.e., of the whole temporal sensory field) which the sub-intervals collectively constitute is something that will take, or will expend, time. Accordingly, the temporal sensory field will come across to the subject, phenomenologically speaking, as being composed of *successively present* sub-intervals of time. And it will, in this way, impart an intimation of Change (Soteriou, 2013: 101, 141-143).⁴⁴

⁴⁴ The mental states which Soteriou has in play are *occurrent* states, constitutively dependent on *occurrent* mental events or processes, rather than (say) dispositional states and events/ processes. This explains, he suggests, why sleeping subjects (who lack such occurrent states and events/ processes) do not share a wakeful subject's awareness of successive presents. Since occurrent mental events and processes are, Soteriou claims, subject to inexorable progressive renewal, the analysis of the awareness of successive presents need not be stated, as above, with regard to unfolding worldly

Further implications for an experiencing subject's awareness of Change are also apparent. The first is that the Change of which the experiencing subject is aware can be attributed a *continuous* character – a continuous character which is not available in terms of the representationalist account. With regard to the representationalist, Soteriou outlines Peter Geach's characterisation of thought, in terms of which an act of thinking, whilst it has a complex character, cannot be broken down into parts which correspond to different parts of the thought's content (similarly, therefore, to the analysis of acts of judging described above). In Geach's terms, there is "... *no succession within any one thought*" (Geach, 1969: 36). Each act of thinking thus forms a "*non-successive unity*" (Geach, 1957: 105), each thought being such that the elements within its complex character cannot "... *occur separately and successively*" (Geach, 1969: 34). Furthermore, there is "... *no gradual transition from one thought to another*" (Geach, 1969: 36). Behind this is the idea that thoughts are to be individuated with regard to their propositional content. Equivalently, in terms of representationalism, conscious perceptual experiences are individuated with regard to their intentional content. Hence, in like fashion to thoughts, Soteriou suggests, in terms of representationalism, each conscious perceptual experience also comprises, in Geach's sense, a non-successive unity. Representational brain states, this is to say, being individuated by intentional content, occupy intervals of time that cannot be broken down into sub-intervals corresponding to different parts of those contents. An extended course of conscious perceptual experience thus consists, on the representationalist account, of a sequence of these non-successive (and non-gradually-transitioning) brain states. Accordingly, the representationalist does not seek to accord conscious perceptual experience a processive, or stream-like, character. Soteriou, in contrast, considers the stream-like character of conscious perceptual experience to be a phenomenological datum. And, indeed, this is something which his account can explain via an appeal to the inexorable progressive renewal of occurrent mental events and processes (see footnote 44 to this section) across the bedrock of mental states characterised (as above) as lacking determinable temporal sub-intervals – these mental states (also as above) depending for their obtaining on the distinctive conscious perceptual relation to which direct realism appeals. In contrast, representationalism, in making no appeal to the conscious perceptual relation as it is characterised by the direct realist, does not attribute to the experiencing subject both an awareness of an overall event occupying a temporal interval t_1 - t_n , and also an awareness that there is a difference in what is experienced during different sub-intervals of t_1 - t_n . Accordingly, whilst direct realism naturally incorporates the idea of stream-like conscious perceptual experience, representationalism does not. In

events, but applies equally in the case of the perception of a static scene (Soteriou, 2013: 138, 142-143).

consequence, representationalism does not posit the processive Change which stream-like conscious perceptual experience would involve. Experienced events and sub-events, it might be put, do not, on the representationalist account, need to be carried along in unbroken file, as the A-theorist would envisage. Accordingly, representationalism, I suggest, has no need of an appeal to objective, absolute Change as it is presented in the A-theory (Soteriou, 2013: 32-45, 90-92, 100-101, 140, 142-143).

As a final point on this topic, it has been said that, in terms of Soteriou's direct realist account, the experiencing subject experiences Change which is epitomised in the notion of successively present times. In part, this analysis has relied on, as is encapsulated in the notion of the temporal sensory field, the subject's having an awareness that only those mind-independent objects which are temporally "*present*" are available to experience. A relevant feature of the temporal sensory field in this context is that, whilst it is experienced as being limited in its extent, the limitation of its extent is not attributed by the subject in question to their own sensory limitations (more will be said about this in section 7.6). And, since the limitation of the field's extent does not seem to arise from the subject's own sensory limitations, the subject might reasonably conclude, Soteriou suggests, that the requisite presentness of perceivable mind-independent objects is a "... *non-perspectival temporal fact*" about those objects and is, as such, independent of the subject themselves (Soteriou, 2013: 132). Successively present times thus arise, this would be to say, regardless of any involvement of a particular subject. In which case, one can plausibly arrive at the idea that, in experiencing Change, the subject is, on Soteriou's account, in fact enjoying *veridical* experience of Change – experience of Change, this is to say, which is metaphysically grounded (Soteriou, 2013: 131-132, 138-139, 141-143, 142 (fn.1)).

7.5 Change as an essential prerequisite of direct realism

Representationalism, then, does not essentially involve metaphysically significant Change. Based on an analysis of Soteriou's version of direct realism, however, a conclusion can be drawn that the experiencing subject undergoes veridical experience of metaphysically significant, and continuous, Change. As such, Soteriou's account would seem to be consistent with the kind of objective, absolute Change presented in the A-theory.⁴⁵ With that in mind, I

⁴⁵ To be clear, this is, in fact, a stronger conclusion than Soteriou himself draws. In particular, he is expressly less committal regarding whether or not, in this context, "... *time itself ... [unfolds] over time*"

now want, in this section, to suggest that metaphysically significant Change is not merely consistent with direct realism, but is, in fact, an *essential prerequisite* of it.

A first indication that metaphysically significant Change might be an essential prerequisite of direct realism can be found in the account provided by Campbell. Within his account, Campbell proposes (in line, on this point, with what Soteriou has been seen to claim) that our perceptual experience is typically temporally extended. And, given that our perceptual experience is typically temporally extended, Campbell contends that it is not the case that an experience of a moving object, or an experience of moving around an object, involves the experiencing subject in the having of a series of momentary views of that object from different standpoints. Rather, if a subject changes their position whilst “... *keeping [their] eye*” on a particular object, then it will be manifest in their experience that just a single object is involved, such that any declaration of the identity of the object viewed from the first position, with the object viewed from the second position, would be redundant, or “*uninformative*” (Campbell, 2009: 658-659 (quotes: 659, 658 respectively); cf. Soteriou, 2013: 187). As such, our notions of identification and reidentification are, it appears, derived from perceptual experience which exhibits a fluid character. This perceptual experience includes both temporally-extended encounters with objects, and periodic reidentifications of objects. It includes experience of objects (including ourselves) engaged in continuous motion. As such, perceptual experience, as Campbell characterises it, is, I suggest, in keeping with experience of the world as that world is depicted by the A-theorist – a world in which changes in the properties, or in the positions, of objects are dynamic and *legato*, rather than consisting in a series of states which are, themselves, eternal and changeless, as they would be characterised by the B-theorist (see section 2.5) (Dainton, 2010: 38-41; Prosser, 2016: 10, 183-184).

Further, I have, in the previous paragraph, made a general reference to what Campbell calls a “*standpoint*” (Campbell, 2009: 657). In fact, Campbell deploys the word “*standpoint*” as something of a term of art, suggesting that:

“We should think of consciousness of [an] object not as a two-place relation between a person and an object, but as a three-place relation between a person, a standpoint, and an object.... We have to factor in the standpoint from which the scene is being observed.... You always experience an object from a standpoint” (Campbell, 2009: 657).

(Soteriou, 2013, 142 (fn. 1), and as regards the real nature of time more generally (Soteriou, 2013: 133).

Accordingly, the conscious perceptual relation underpinning direct realism is not, Campbell is claiming, a relation just between a perceiver and a mind-independent object and its properties. Rather, the posited standpoint also comprises one of the *relata* of that relation. And, as Campbell goes on to make clear, this notion of a standpoint encompasses more than merely the spatial position of the perceiver. Rather, it will also be determined by, for example, the relative orientations of the perceiver and the object in question, how close the perceiver is to the object, and any obstructions between them. It will also need to be construed so as to reflect the particular modality, or modalities, of perception in play in the particular case. Further, it will tend to involve a specification of the particular time relevant to the act of perception (Campbell, 2009: 657-658). And, being one of the *relata* in the conscious perceptual relation, the standpoint, as Campbell specifies it, is an essential aspect of conscious perceptual experience. As such, it can be said that, on Campbell's account, conscious perceptual experience essentially involves an awareness on the part of the experiencing subject of their own, subjective location (both spatially, and temporally, speaking), and of the particularities of their situation, within the objectively determined layout of the environment of which they are a part and on which their perceptions depend (something which, I suggest, has resonances with the discussion of Gareth Evans in chapter 6). In a related vein, as has been touched upon in section 7.2.3 (footnote 43), Martin posits a strong connection, verging on an identity, between a subject's having a "*point of view*", or a "*perspective*", on the world, and conscious perceptual experience – a connection which obtains even in cases of hallucination (Martin, 2006: 378). On Martin's account, this is to say, to have a perspective, or a point of view, just is to have conscious perceptual experience.

Whilst it should not be thought that Campbell's standpoint, and Martin's perspective, or point of view, amount to one and the same thing, I think, nevertheless, that they do suggest some common features of conscious perceptual experience. In particular, both suggest that conscious perceptual experience has an essential subjective aspect – an awareness, it might be put, on the part of the experiencing subject of the part which they play in the effectuation of a particular experience. More particularly, such awareness will include the experiencing subject's awareness of their being located at the centre of some kind of subjective coordinate system – a subjective coordinate system exhibiting both spatial, and temporal, dimensions.

Can more be said, however, as to why it might be claimed that this subjective coordinate system arises in a context of metaphysically significant Change? One way to support this claim is, I suggest, to recall, from section 7.1, that Campbell encapsulates the differences between direct realism and representationalism by saying, first, that, in terms of direct realism, our experience of mind-independent objects and their properties, is "... *experience of the*

categorical” – experience, that is, of the intrinsic character of the mind-independent objects and their properties (Campbell, 2002: 137). Accordingly, it is the categorical properties of an experienced object which play the constitutive role in determining the manifest phenomenal character of the relevant experience. In terms of representationalism, however, experience, Campbell suggests, represents objects as functional connections, and the properties of objects as complexes of dispositional characteristics. In consequence, according to representationalism, experience, rather than introducing us to the underlying objects within which functionality and dispositional potential reside, instead represents the world at a level of functional isomorphism – providing us, therefore, just with awareness of the effects which are to be associated with an underlying object in certain circumstances. But that our experience is, indeed, “... *of the categorical*”, Campbell seeks to justify by claiming that we do, for example, experience categorical *shape* properties, such as *roundness*, rather than merely having sensations which inform us of the various dispositional characteristics of round things. Indeed, we habitually understand dispositional characteristics such as these as deriving from the categorical properties which we experience. As such, we do not merely experience objects as sets of potentialities, or as clouds of “... *endless threats and promises*”, as Campbell characterises the representationalist position (Campbell, 2005: 104). Rather, we take it that our experience is telling us what the world is really like (Campbell, 2002: 137-139, 142; 147-151; Campbell, 2005: 104; Soteriou, 2016: 93-94, 99).

Campbell's claim, then, can be put in the terms that, in accordance with direct realism, our experience is of the intrinsic, underlying character of objects and their properties whereas, in terms of representationalism, our experience is merely experience of functionality, and of dispositional potential. Indeed, in this regard, as was said with regard to the philosophical zombie in section 7.2.3, it can be said that, in terms of representationalism, an experiencing subject is in a perceptual state that plays a certain type of functional role which is to be specified in terms of its typical causes, and its cognitive and behavioural effects. And this, then, ties in directly with the idea that, in terms of representationalism, experience is, as it were, “of the dispositional”. This is because the pattern of functional connections and dispositional characteristics in terms of which an object is said, by the representationalist, to be represented in experience is, as Campbell puts it: “... *determined only by the dispositional characteristics of the external stimuli*” (Campbell, 2002: 150).

In contrast, as has been said, experience “*of the categorical*” is experience of the intrinsic character of the external stimuli. And, what I now also want to suggest is that, if experience is to be of the categorical, then that experience must essentially involve metaphysically significant Change. Experience of the categorical must essentially involve, this is to say,

experience of mind-independent objects as being caught up in time – caught up in what D.C. Williams calls the “... *whoosh of process, the felt flow of one moment into the next*” (Williams, 1951: 466). And this claim is related to what has been said earlier in this section about the (re-)identification of objects. On the representationalist account, provided the dispositional characteristics of external stimuli remain constant, it would not matter to the utility of an experience that the intrinsic properties of the experiencing subject’s environment had changed, since the same cognitive and behavioural effects would remain appropriate. As such, the representationalist subject faces the “... *endless threats and promises*” without necessarily knowing what lies behind (Campbell, 2005: 104). And this is because knowing what lies behind – knowing the intrinsic character of mind-independent objects, and of their properties – requires knowledge of those objects as determined in time, such that matters of individuation, identification, and reidentification can be addressed at the level of the intrinsic. Accordingly, if experience is to tell us (as above) “what the world is really like” in Campbell’s sense, then that experience must be of a world which necessarily involves metaphysically significant Change. And what this amounts to saying, therefore, is that metaphysically significant Change is not merely consistent with direct realism, but is, in fact, an essential prerequisite of it.

Part 3 – Direct realism and a world which is objectively B-theoretic

7.6 Direct realism and the subjective temporal frame of reference

Of course, it is one thing to say that metaphysically significant Change is an essential prerequisite of direct realism if, as may well be the case with Campbell, Martin, and Soteriou, the experienced world to which appeal is being made is a world which, itself, exhibits objective, absolute Change (i.e., is a world which is objectively A-theoretic). Following the arguments of chapters 3 and 5, however, I have proposed that the world, in not containing mind-independent, objective, absolute Change, is a world which is, in this sense, objectively B-theoretic – a proposal which, if correct, is, at first sight, to the detriment of direct realism. But what I now want to suggest is that the metaphysically significant Change which is an essential prerequisite of direct realism need not be secured via an appeal to a world which is objectively A-theoretic. Rather, that metaphysically significant Change is to be secured with reference to what has been referred to in earlier chapters as the subjective temporal frame of reference.

It might first be noted in this regard that the point of origin of the subjective temporal frame of reference has been said to comprise the temporal location of an experiencing subject’s point

of view, situated at their subjective “*now*” – an analysis which, I suggest, has a certain correspondence with what has been said in section 7.5 regarding Martin’s “*point of view*” and Campbell’s “*standpoint*”, and with the subjective coordinate system which I have posited on their behalf. To set out in more detail, however, how the subjective temporal frame of reference might be applied within direct realism, I will first take a brief detour into space. It was said in section 7.4 that Soteriou makes the (non-diaphanous) claim that it is not only experienced mind-independent objects, and their properties, which shape the manifest phenomenal character of perceptual experience. Rather, certain structural features of the distinctive conscious perceptual relation which defines direct realism also have a role in the shaping of this manifest phenomenal character. One such structural feature has been seen to be the temporal sensory field. Soteriou, however, also posits a further structural feature, which he terms the “*spatial sensory field*” (Soteriou, 2013: 115). (After all, as was said in section 7.4, mind-independent objects are not only “*time-occupying*” objects, but “*space-occupying*” objects, too (Soteriou, 2013: 120, 124).) In one sense, the spatial sensory field is merely a description of the practical spatial limitations which apply in all cases of perceptual experience. And, indeed, it is this connection with the practical spatial limitations of perceptual experience which leads to the spatial sensory field’s having a role in the particularisation of the manifest phenomenal character of perceptual experience. More specifically, the spatial sensory field has *boundaries*. In virtue of these boundaries, perceptual experience is experienced as involving a bounded spatial region. And this is something which then feeds into the manifest phenomenal character of such experience (Soteriou, 2013: 118-120).

We can put it, then, that, on Soteriou’s account, when a subject has a perceptual experience of certain mind-independent objects, it seems to that subject that they are aware of the boundaries of a spatial sensory field – i.e., that they are aware of a region of space within which those objects are located. In contrast to the temporal sensory field, the limits of the region of space comprising the spatial sensory field are experienced as being determined by the experiencing subject’s own sensory limitations. And this leads into a further point, namely, that, because the boundaries of the relevant region of space appear as determined by the subject’s own sensory limitations, the subject will be alive to the fact that, potentially, there exist more things that might be perceived outside of those boundaries. For example, in a straightforward case of visual perception, the experiencing subject will be aware of a cone of physical space stretched out in front of them, and would recognise that moving their head would introduce them to a different cone. This point can be put in terms of the subject’s having an awareness that the experienced region of space is, in fact, a sub-region of a region of space that has that sub-region as a part. As such, the subject can be described as being aware that there are other sub-regions of space which are potential locations for objects of

perception which currently lie unperceived. And, Soteriou tells us, this awareness of the experienced region's being a sub-region in this way institutes a further structural feature of the manifest phenomenal character of the subject's perceptual experience (Soteriou, 2013: 116, 118-120, 130-131).

It is interesting to note that, as regards the temporal sensory field, Soteriou does not make a claim equivalent to this idea of the subject's having an awareness of an experienced region of space as being a sub-region of a larger region. He does not, this is to say, propose that, in virtue of our being aware that, if an entity is to be perceptually accessible to us, then it must be temporally located within the temporal sensory field, we are also aware that the temporal interval comprising the temporal sensory field is, in fact, a sub-interval of a more extensive temporal span which, potentially, houses other entities beyond the reach of the temporal sensory field. Indeed, Soteriou may not, in fact, consider that we do have any awareness of the temporal sensory field as a sub-interval of a more extensive span, perhaps because the consideration regarding the spatial case is, as I understand it, largely predicated on the spatial sensory field being delimited by boundaries determined by our own sensory limitations in a way that the temporal sensory field is not. However, what I want to suggest is that it can plausibly be claimed, equivalently to the spatial case, that we do have an awareness of the operative temporal interval (corresponding to the temporal sensory field) as a sub-interval of a greater whole, and that, as in the spatial case, this awareness institutes a structural feature of the phenomenal character of perceptual experience. As just noted, the temporal sensory field does not have manifest boundaries determined by our sensory limitations (nor, indeed, manifest boundaries corresponding to the temporal extent of any particular worldly object of perception (Soteriou, 2013: 118, 132-133)). It is therefore appropriate, I think, to express this proposal in terms of our being aware of a *part* of time, and to our being aware of that part as *such*. This can be compared to Kant's saying: "*Different times are only parts of one and the same time*" (A31-32/B47). More particularly, it can be compared to Kant's saying, with regard to space, that: "... *if one speaks of many spaces, one understands by that only parts of one and the same unique space. And these parts cannot as it were precede the single all-encompassing space as its components... but rather are only thought in it*" (A25/B39; cf. Soteriou, 2013: 116, 118 (fn. 6)).

Indeed, this proposal amounts to more than just the claim in the last paragraph to the effect that we have an awareness of the operative temporal interval (corresponding to the temporal sensory field) as a sub-interval (a part) of a greater whole, and that this awareness institutes a structural feature of the phenomenal character of perceptual experience. In the spatial case, the surmised sub-regions beyond the operative spatial sensory field will, I suggest, be

apparent to the subject as being up/down, left/right, or in-front/behind, in relation to the operative field (this discussion will accord with what was said regarding how the world is immediately presented to us in the analysis of Evans in section 6.3). In the temporal case, we can say, first, that, on the basis of Soteriou's account as set out in section 7.4, those entities which, temporally speaking, are perceptually accessible to us are those entities which we are perceptually aware of as being temporally *present*. And, on this basis, I suggest, the subject will be aware of the surmised parts of time beyond the operative temporal sensory field as being *past*, or *future*, in relation to the operative field. As such, the subject understands that there is the potential for there to be entities which, whilst they are not perceptually accessible from the subject's current temporal location, nevertheless potentially occupy different temporal locations situated to the past, or to the future, of that current temporal location. Accordingly, what I want to propose is that the structural feature of the phenomenal character of perceptual experience resulting from a subject's awareness of the temporal sensory field's being a part of a greater temporal whole will, equivalently to the up/down etc. applicable in the spatial case, introduce an awareness of the pastness or futurity of the perceptually inaccessible parts of time.

I mentioned in section 7.5, with regard to Campbell's "*standpoint*", that, on Campbell's account, conscious perceptual experience essentially involves an awareness on the part of the experiencing subject of their own, subjective location (both spatially, and temporally, speaking) within the objectively determined layout of the environment of which they are a part and on which their perceptions depend. This was said in the context of a world which was objectively A-theoretic. Nevertheless, I suggest, the pertinent features of Campbell's claim have been retained in the analysis in the previous paragraph. What is also retained is the idea that those entities which, temporally speaking, are perceptually accessible to an experiencing subject are those entities which the subject is perceptually aware of as being *present*. In section 7.5, this thought could be expressed in terms of the "*standpoint*" and the "*point of view*" promulgated by, respectively, Campbell and Martin. In terms of the proposed account, however, it is to be parsed as meaning that the entities in question are those which stand in the relation of presentness to the experiencing subject's subjective "*now*" situated at the temporal location of that subject's point of view, and corresponding to the point of origin of the subjective temporal frame of reference (an analysis which is, in any case, in keeping with the subjective coordinate system posited as regards Campbell's and Martin's accounts in section 7.5). Those entities which are not, temporally speaking, perceptually accessible are those entities which stand in the relation of futurity, or the relation of pastness, to the temporal location of the experiencing subject's subjective "*now*" situated at the temporal location of that subject's point of view. And the notion that, say, the fleeting *presentness* of certain entities is,

as I claim direct realism to presuppose (section 7.5), a *non-perspectival* temporal fact about those entities is then to be secured, not via an appeal to objective metaphysical A-theoretic features of the world, but via the metaphysical significance of the subjective “*now*” with which those entities temporally coincide (and equivalently as regards non-perspectival futurity and pastness). On this basis, the claim is, therefore, that the temporal structural feature of experiencing which imparts to conscious perceptual experience the metaphysically significant Change which is, in terms of direct realism, essential to it, is dependent on a metaphysically significant subjective temporal frame of reference which has, at its point of origin, the experiencing subject’s subjective “*now*”. Differently put, if the experiencing subject, as characterised in terms of direct realism, is real, then so is their subjective point of view and so, therefore, is the subjective temporal frame of reference.

Part 4 – Conclusion to chapter 7

7.7 Concluding comments

In this chapter, I have argued that conscious perceptual experience, as it is characterised by the direct realist, essentially involves metaphysically significant Change. I have suggested in section 7.6 that, in the context of a world which, in not containing mind-independent, objective, absolute Change, is, in this sense, objectively B-theoretic, this metaphysically significant Change is imparted to conscious perceptual experience in virtue of a certain temporal structural feature of the distinctive conscious perceptual relation in terms of which direct realism is defined – this structural feature presupposing the metaphysical significance of the subjective temporal frame of reference. Since it has been argued in section 7.4 that perceptual experience, as it is characterised by the representationalist, does not essentially involve metaphysically significant Change, this has supported the claim that, with reference to some, though not all, accounts of experiencing subjects, the subjective temporal frame of reference is to be accorded metaphysical significance. The chapter as a whole has thus served to support the claim from chapters 3 and 4 that the question of the metaphysical significance of Change is best considered alongside a consideration of the nature of the experiencing subject – something which indicates more generally that the metaphysics of mind, and the metaphysics of time, are correlated. This claim will be further developed in chapter 8.

Accounts of persons and the subjective temporal frame of reference

In chapters 4 and 6, a case was made for the philosophical respectability of the notion of the subjective temporal frame of reference. In chapter 7, it was then claimed that, in the context of a world which, in not containing mind-independent, objective, absolute Change, is, in this sense, objectively B-theoretic, direct realism, in contrast to representationalism, essentially involves a subjective temporal frame of reference which is metaphysically significant. This was said to support the claim that, with reference to some, though not all, accounts of experiencing subjects, the subjective temporal frame of reference is to be accorded metaphysical significance. More generally, it also served to support the claim that the question of the metaphysical significance of Change is best considered alongside a consideration of the nature of the experiencing subject.

In this chapter, which in effect forms a companion chapter to chapter 7, I seek to further support these claims via an analysis of accounts, not of conscious perceptual experience as in chapter 7, but of *persons*. To this end, certain accounts of persons will be examined with a view to ascertaining whether or not they essentially involve metaphysically significant Change. In Part 1, I argue that functionalism (section 8.2), and the account of personal identity provided by David Hume (section 8.3), do not. In Part 2, however, I claim that metaphysically significant Change is an essential prerequisite of those accounts which I characterise as “accounts of persons as embodied consciousnesses”, such as the account of empirical persons provided by Immanuel Kant. As Kant presents his account, I argue that the Change which it presupposes is objective, and absolute – Change, that is, as it is presented in the A-theory (sections 8.5 and 8.6). I claim in Part 3, however, that the metaphysically significant Change which is an essential prerequisite of Kant’s account, and of accounts of persons as embodied consciousnesses more generally, is secured within a world which is, as I claim, objectively B-theoretic through an appeal to the metaphysical significance of the subjective temporal frame of reference. Since functionalism, and the Humean person, have been said not to essentially involve metaphysically significant Change, this conforms with the claim in chapter 7 that, with reference to some, though not all, accounts of experiencing subjects, the subjective temporal frame of reference is to be accorded metaphysical significance. This analysis also leads, in

section 8.8, to the claim that the experiencing subject situated at the point of origin of a subjective temporal frame of reference which is metaphysically significant is essentially removed from (or “outside”) the static B-theoretic time-line in a way which, for example, the functionalist subject is not. A related argument is then made to seek to demonstrate the immunity of the proposed account to McTaggart’s Paradox.

Part 1 – Accounts of persons which do not entail metaphysically significant Change

8.1 Introduction to Part 1

In chapters 4 and 6, discussion has been made of what has been characterised, in a very general sense, as “an ordinary human subject pursuing an ordinary course of experience through the world”. In this chapter, different ways in which this generally characterised ordinary human subject might be more rigorously specified will be examined with a view to ascertaining what metaphysical significance might be accorded to the posited subjective “*now*” and, therefore, to the posited subjective temporal frame of reference in terms of these more rigorous specifications. As such, this chapter will involve a discussion of *accounts of persons*. I will begin with the account of persons proposed by the functionalist.

8.2 Functionalism

According to some accounts of persons, persons are what Daniel Dennett terms “*syntactic engines*” (Dennett, 1982: 26). A syntactic engine can be thought of as a “*physical ‘thinking machine’*” (Robinson, forthcoming: 7). Accordingly, in terms of such accounts, what we might pre-theoretically think of as the mental realm enjoyed by persons is ultimately to be explained in physical terms (Foster, 1991: 2). More generally, such accounts posit an identity between the mind and the brain (and, therefore, between states of the mind and states of the brain), and consider the brain to operate in the manner of a computer, or an information processor.

One account consistent with the syntactic engine depiction of persons is *behaviourism*. In terms of behaviourism, a subject’s mental states and mental properties are to be understood purely in terms of that subject’s behavioural states and dispositions (Foster, 1991: 33; Hossack, 2007: 261). Statements about the mind, this is to say, “... *are to be ultimately construed in purely behavioural terms*” (Foster, 1991: 33).

Behaviourist accounts, however, are nowadays widely thought to fail to accommodate the natural idea that a subject's behavioural dispositions arise in the context of a multiplicity of causally-interacting mental states. Accordingly, behaviourist attempts to identify particular mental states with particular behavioural dispositions are, in failing to take account of these causal interactions, generally considered unsatisfactory (Foster, 1991: 40-46). Out of this concern has emerged *functionalism*. According to functionalism, mental states are to be individuated by their functional role – by, that is, what causes them, and what they cause – within a causal system involving the bearer of those mental states. A mind, on this basis, is a system with inner, or mental, states that cause, and are caused, in a characteristic pattern. And behaviour is to be explained with reference to the complex interactions of many such mental states (Hossack, 2007: 173, 261).

What I will now examine is whether or not the functionalist characterisation of the experiencing subject involves metaphysically significant Change, and a metaphysically significant “*now*”. In considering this, I want to look first at how we might think that the functionalist subject would find the world, and the events within it, to obtain. It has been said above that, in terms of functionalism, a mind is a system with inner states that cause, and are caused, in a characteristic pattern. These inner, or mental, states are individuated by what causes them, and what they cause, within a causal system involving the bearer of the mental states. And what this means, I suggest, is that the functionalist subject will inhabit a world in which happenings and occurrences are reliably ordered – this ordering being the ordering of causality, in accordance with which causes precede, in some sense, their effects. Now, it was seen in section 2.4 that it is widely held amongst B-theorists that temporal directionality (i.e., the direction of earlier-to-later) is reducible to causal asymmetry – reducible, that is, to the order of causal precedence. Accordingly, the world which the functionalist subject will inhabit is, I suggest, a world containing an earlier-to-later temporal direction which is isomorphic with the direction of causal precedence. In other words, the functionalist subject will inhabit a world which is mapped out by the B-relations of earlier-than and later-than.

In this regard, the functionalist subject can be thought of as a participant in the causal episodes arrayed along the B-theoretic time-line. Where they are on that time-line corresponds to their indexical present – an indexical present which they will have a sense of as, at least, something akin to a placeholder in a causal chain – a necessary background condition for efficacious causation to obtain. Beyond that, however, there would seem no need to go any further so as to include, for example, as a part of the way in which the functionalist subject finds the world and the events within it to obtain, the idea that the present is in any sense “special” from a metaphysical perspective (*cf.* section 2.2). Indeed, even if the world, contrary to my claims,

were objectively A-theoretic, then, to put it in terms of what Craig Bourne calls the “*Present Problem*”, the functionalist subject would seem to have no need to know whether their indexical present did, or did not, correspond to a posited A-theoretic metaphysically privileged present (Bourne, 2006: 21).⁴⁶ Whilst, as above, they inhabit a world in which happenings and occurrences are reliably ordered, any metaphysical specialness which their indexical present might have would, I suggest, be orthogonal to the life of that functionalist subject. Accordingly, I suggest, the realisation of the functionalist subject demands no more of the world, temporally speaking, than is provided by the B-theory. In particular, the realisation of the functionalist subject involves no appeal to a metaphysically significant “*now*”, or to Change which is metaphysically significant.

8.3 David Hume’s account of personal identity

I have claimed in section 8.2 that the account of persons proposed by the functionalist does not essentially involve a metaphysically significant “*now*”, or Change which is metaphysically significant. As such, if the world is, as I claim it to be, a world which is objectively B-theoretic in the sense of its not containing mind-independent, objective, absolute Change, then functionalism has no reason to appeal to a metaphysically significant subjective temporal frame of reference in order to secure the notion of metaphysically significant Change in the way that direct realism was seen to do in section 7.6. What, though, might be the position as regards the account of persons provided by David Hume? It is to Hume’s account that I will now turn.

Hume, in the section of *A Treatise of Human Nature* entitled “*Of personal identity*”, claims that the notion of a “*self*”, or of a “*person*”, whilst it is a notion that a human subject will naturally infer, is, in fact, a fiction. As such, Hume’s account of persons amounts to a direct rejection of the notion of the Cartesian *ego* (Descartes, 1641: AT VII, 25)⁴⁷. This is because, whilst Hume accords the human subject conscious mental states, on Hume’s account, *contra* Descartes, these episodes of mentality are not, always and necessarily, constituent elements

⁴⁶ What Bourne calls the “*Present Problem*” is the problem which, he argues, should be addressed by those theories of time which posit a metaphysically privileged present of explaining how we can know that our indexical present is identical with such metaphysically privileged present, rather than our in fact existing in (say) a metaphysically real past (Bourne, 2006: 21-24).

⁴⁷ References to Descartes’ work in this form follow the eleven volume (eds.) C. Adam and P. Tannery *Oeuvres de Descartes* of 1897-1913.

in the biography of some different kind of thing to which the episodes in some sense *belong*. Rather, on Hume's account, the episodes of mentality are self-contained, ontologically autonomous entities with their own, independent existence (Foster, 1991: 205-206).

In arguing for this conclusion, Hume invokes the basic over-arching framework of his "*science of human nature*" (T 1.1.1, 7)⁴⁸. Underpinning this framework is the theory that all of our perceptions fall into one of two distinct kinds, namely, "*impressions*", or "*ideas*" (T 1.1.1, 1). Impressions include sensations, feelings and emotions, and are more forceful and lively than are ideas. Indeed, ideas, which are akin to thoughts, are "*faint images*" of the impressions from which they are derived or copied (T 1.1.1, 1). Since Hume denies that any of our knowledge is, for example, innate, and contends that the validity of any theories or suppositions must be tested against experience, it therefore follows that all knowledge (with certain incidental exceptions) derives, ultimately, from experience as it is manifested in an impression (T 1.1.1, 7; T 1.3.14, 158-160). Hence, if we are to have a plausible account of a self (or a person), then we are first going to need an *impression* of a self, from which an *idea* of the self can then be derived.

This, however, Hume tells us, presents a problem (T 1.4.6, 251-252). When we speak of a *self*, we mean something which is simple, unchanging, and persisting. But, in terms of Hume's system, we can never know that such a thing really exists. As has been said, to know that such a thing really exists would require that we have the requisite idea, derived from a suitable impression. And, just like our notion of a self, this impression would, itself, have to be simple and unchanging. However, we are immediately conscious of no such thing. Even if we were to try to seek out such an impression, all we would ever encounter would be a quick succession of ordinary impressions and ideas – never an unattended self. As Hume famously puts it:

"For my part, when I enter most intimately into what I call *myself*, I always stumble on some particular perception, of heat or cold, light or shade, love or hatred, pain or pleasure. I never catch *myself* at any time without a perception, and never can observe any thing but the perception" (T 1.4.6, 252).

Indeed, even to attempt to seek out an impression of a self is to be guilty of a systematic misunderstanding since "... *self or person is not any one impression, but that to which our several impressions and ideas are suppos'd to have a reference*" (T 1.4.6, 251). And, given

⁴⁸ This is a reference to Hume's *A Treatise of Human Nature* (1739/1740), Book 1, Part 1, Section 1, page 7. Similarly styled references refer to the *Treatise* in an equivalent way.

this lack of an impression of a self, we can never acquire knowledge of anything amounting to our commonplace notion of a self. In consequence, we can only conclude that we are, in fact:

“... nothing but a bundle or collection of different perceptions, which succeed each other with an inconceivable rapidity, and are in a perpetual flux and movement” (T 1.4.6, 252).

The mind, in other words, is constituted just by “*successive perceptions*”, each reminiscent of a theatrical scene (T 1.4.6, 253). But these particular theatrical scenes are played out in the absence of a stage, of an audience, and even of a theatre (T 1.4.6, 252-253).

Hume does not deny that we will find this conclusion counterintuitive (T 1.4.6, 253-262). We do, he accepts, tend to suppose that these successive perceptions are, indeed, related to a single, continuant, underlying identity which we identify as a self. But this tendency, he claims, rests upon a mistake which the mind makes. Our minds have a propensity to conjure up connections between things – to contrive links and relations between things. Hence, whilst our perceptions are really distinct existences, each different, distinguishable, and separable from each other, we naturally, and unconsciously, imagine there to be a “*real bond*” between them (T 1.4.6, 259). In fact, our feeling of there being a real bond is merely down to the effects of the “*associating principles*” of resemblance, contiguity and causation, in virtue of which our distinct ideas appear to be related to one another (T 1.3.9, 107). These three principles foment the ready transition of our thoughts from one idea to the next, with an ease that suggests to us that the ideas must be, not just related, but also somehow conjoined, or unified, within something else (T 1.4.6, 260). And what it is that we take our ideas to be so unified within is that which accords with our notion of a self. Accordingly, from a purely imagined association of our ideas, we come to infer the presence of a simple, unchanging, and persisting self. This inferred self is, however, simply a “*fiction*” (T 1.4.6, 254), the source of our idea of it being, not an impression of a self, but the “... *smooth and uninterrupted progress*” of our thoughts along a seemingly bonded chain of ideas (T 1.4.6, 260).

In considering whether this account of the Humean subject essentially involves metaphysically significant Change, it is of interest to examine what Hume himself tells us about time. Time, in a way initially similar to the self, does not sit straightforwardly within the Humean system since, like the self, time does not “[*appear*]... *as any primary distinct impression*” (T 1.2.3, 37). However, unlike with the self, our idea of time does not arise from an over-heated imagination. Rather, our idea of time is derived from “... *the succession of our perceptions of every kind, ideas as well as impressions*” (T 1.2.3, 34-35). On this basis, “... *time cannot make its*

appearance to the mind... alone" (T 1.2.3, 35) but, rather, amounts to a "*manner of appearance*" (T 1.2.3, 34) – the manner, that is, in which a succession of perceptions appears to us (T 1.2.3, 36). Time, this is to say, is nothing over and above "... *different ideas, or impressions, or objects dispos'd in a certain manner, that is, succeeding each other*" (T 1.2.3, 37). Hence: "*Wherever we have no successive perceptions, we have no notion of time*" (T 1.2.3, 35).

Hume illustrates this conception of time with the example of a flute. Our hearing a sequence of five notes on a flute will, he tells us, generate the idea of time. Time itself, however, will not appear as a sixth impression, nor as any kind of excitation of the mind from which a further, distinct idea might be derived (T 1.2.3, 36). Rather, our idea of time consists in the mind's "... *[taking] notice of the manner, in which the different sounds make their appearance*" (T 1.2.3, 37).

Putting this together, we can say that, for Hume, time is constituted by the successive manner in which our perceptions appear to us.⁴⁹ Moreover, as was seen above, "*successive perceptions*" are that which (and *all* that which) constitute the mind. It might be suggested, therefore, that Hume is proposing an account in which mind and time are very much intertwined. On the one hand, time, being dependent on perceptions, is mind-dependent. On the other hand, mind, in being constituted by perceptions which are successive, might be thought to presuppose (or at least to need to overlay) some sense of Change in order to give substance to the required notion of succession. In this sense, one might start to think of Hume as an early (or early modern) proponent of some kind of metaphysically significant subjective temporal frame of reference.

It is not clear, however, that Hume's account of personal identity can, in fact, properly include Change, or even any kind of B-theoretic temporal ordering. This is because, as Hume himself notes in the appendix to the third volume of the *Treatise*, his account of personal identity is fundamentally flawed (T Appendix, 635-636). As has been said, he is seeking to claim that "... *all our distinct perceptions are distinct existences*", and that their seeming unification in "... *something simple and individual*", such as a self, is merely a product of our imaginations (T Appendix, 636). Nevertheless, he also seems to recognise that any meaningful account of personal identity will need to provide a description of "... *that to which our several impressions*

⁴⁹ Hume does, on occasion, also seemingly accord time a *sui generis* metaphysical standing apart from the successive manner of perceptions, though it will not be necessary to elaborate on this aspect of his system for current purposes (T 1.2.2, 29-31, T 1.2.5, 64).

and ideas are suppos'd to have a reference" (T 1.4.6, 251) – in other words, a description of whatever it is that exhibits the required "identity". Hence, having "*.. loosen'd all our particular perceptions*" by assigning them to an unfastened "*bundle*", Hume is, somehow, going to have to find a way to "*... [bind] them together*" again (T Appendix, 635).

Since he cannot appeal to the notion of a self, the only way in which Hume might claim that our diverse perceptions are bound together in the required sense is by suggesting that there obtain some kind of connections between them – not the imaginary "*real bond*" which we contrived in coming to believe, wrongly, in the self, but genuine real connections which link the perceptions such that they form a single, unified whole. Unfortunately, though, this is a non-starter. On Hume's account, "*... the mind never perceives any real connexion among distinct existences*" (T Appendix, 636). Accordingly, the required real connections between perceptions can never be discovered by human understanding and since, for Hume, the validity of any theory must be tested against our experience, then we must reject the suggestion that these purportedly real connections do, in fact, obtain. Hence, there is no way for Hume to build the "*loosen'd... perceptions*" back into an account of personal identity. He simply cannot provide an account of whatever it is to which our perceptions "*have a reference*". Indeed, he even lacks any basis on which to assign the various individual perceptions constituting his untethered bundle to any one human subject, rather than to any number of such subjects.

Applying this analysis to Hume's account of time and Change, we can see that there is, in fact, no way in which the five events constituted by the five notes on the flute would necessarily appear in a manner suggestive of Change, even in phenomenological terms. This is because there is no basis even on which to claim that the five notes are all heard by the same conscious being. And, with nothing to unify the perceptions of them within a single consciousness, the sequence of notes simply cannot be assimilated into any notion of Change (or even of B-theoretic temporal ordering). Hence, whilst Hume himself does seem to posit Change, it is not the case that any commitment to metaphysically significant Change is forced upon us by an endorsement of Hume's account of personal identity. As was the case with functionalism, therefore, if the world is objectively B-theoretic, Hume's account would make no appeal to a metaphysically significant subjective temporal frame of reference.

Part 2 – Accounts of persons which do entail metaphysically significant Change

8.4 Introduction to Part 2

The reason that Hume's account of personal identity does not force upon us any commitment to metaphysically significant Change (nor even impress upon us any *feeling* of Change) can be expressed in terms of its failure to provide any sense of a continuant, conscious being ploughing a cohesive experiential furrow through an external world. Rather, Hume promulgates a conscious being which, at best, consists in a starburst of disengaged "*theatrical scenes*" (T 1.4.6, 253). As such, the Humean being has no need of a metaphysical "*now*" – not even of a transient psychological "*now*". Simply put, the Humean being can't get its head around a short flute riff because there is no "head" in the required sense.

One way to encapsulate this, I believe, is to say that Hume's conception of the experiencing subject (and, indeed, the functionalist conception) are very different to the notion of a person as posited by, for example, John Locke. Locke, whilst he did not offer a characterisation of consciousness, regards consciousness as essential to thought (Locke, 1690: Book II, chapter i.10, chapter xxvii.9) and, thereby, to personal identity since, for Locke, a person is:

"... a thinking intelligent being, that has reason and reflection, and can consider itself as itself, the same thinking thing, in different times and places..." (Locke, 1690: Book II, chapter xxvii.9).

In contrast to Hume, and to functionalism, the accounts of persons which I will now discuss can, I believe, be seen to be in accord with Locke's description. These accounts I will refer to as *accounts of persons as embodied consciousnesses*. Accounts of persons as embodied consciousnesses have been provided by, for example, P.F. Strawson (1959; 1966) and Quassim Cassam (1997). I will, however, mainly focus on the seminal account of this kind, namely, Immanuel Kant's account of the empirical person⁵⁰ – an account which, interestingly, can very much be seen to be a response to Hume.⁵¹

⁵⁰ In terms of Kant's system, persons, and, indeed, time, obtain just at a level of empirical reality. In what follows, however, I will effectively treat them as parts of metaphysical reality. I will thus, in general, stop short of the noumenal aspects of the Kantian system.

⁵¹ Kant famously credits a recollection of Hume as having "... interrupted [*his*] dogmatic slumber" (Kant, 1783: Volume 4, 260). Regarding Hume's account of personal identity, for Kant, the Humean mind,

8.5 Accounts of persons as embodied consciousnesses

It was seen in section 8.3 that Hume rejects the Cartesian view that episodes of mentality are, necessarily, constituent elements in the biography of some different kind of thing such as a self (Descartes, 1641: AT VII, 25). Kant, however, whilst his account is ultimately very different to that of Descartes, offers a position which is much more nuanced in this respect. Indeed, at one level, Kant effectively endorses Descartes' claim. This he does in claiming that all of our perceptions "*must be*" accompanied by "*I think*" if such perceptions are to be able to be thought about so as to render them meaningful (B131-132; cf. A117, A123)⁵². As such, all perceptions worthy of the name are essentially ascribed to a *self*. However, it is important to recognise that Kant's Cartesian-esque *self*, whilst it is essential to personhood, should not, in and of itself, be thought of as being a *person* in Kant's terms (A348-351, B407-408). Unlike Hume, this is to say, Kant does not identify a person with a self, *simpliciter* – not even with what we would think of as a continuant, or persistent, self. Rather, for Kant, a person is to be identified with an "*abiding self*" (A107), or an "*abiding subject*" (A365). I will now turn to outlining Kant's somewhat tortuous account of this Kantian person.

As was the case with Hume, the beginnings of Kant's account of a person are to be found in his account of experience. In the *Critique of Pure Reason* (1781/ 1787), Kant claims that there are limits to what we can conceive of, or make intelligible to ourselves, as a possible general structure of experience of the world. This is to say, certain underlying principles are presupposed in any conception of experience of the world which we can find to be a *coherent* conception. Much of the *Critique* is then devoted to Kant's attempt to articulate this limiting framework of principles.

One aspect of Kant's account of a coherent conception of experience is that, if any object is to enter into our experience, we must, for a start, have an awareness of that object. In addition, however, we must also be able to recognise the general characteristics of the object so as to be able to classify it in terms of what Kant terms the "*concepts*" (A85-86/B117-119, A92-93/B125-126, A135/B174). As he makes the point: "... [the concepts] are related necessarily and *a priori* to objects of experience, since only by means of them can any object of experience

being a mind constituted just by "*successive perceptions*", would be a mind which is incapable of thought (T 1.4.6, 253; A51/B75).

⁵² References of the form (A[number]) and (B[number]) are to the original pagination of, respectively, the first and second editions of Kant's *Critique of Pure Reason*, 1781/ 1787. Quotes are from the translation by P. Guyer and A.W. Wood (1998).

be thought at all" (A93/B126). Coherent perceptual experience, this is to say, will necessarily be experience of particular instantiations of these concepts – the concepts being things which we possess *a priori* (B143).⁵³

Further, on grounds which I will elaborate upon in section 8.6, Kant claims that our experience is necessarily temporally successive (A34/B51, A99). And any coherent conception of experience, he suggests, must also presuppose that there is sufficient unity across our temporally successive experiences as to allow for the possibility of the self-ascription of these experiences by the subject in question (A144/B183, A189-211/B232-256). We saw above that all of our perceptions must, on Kant's account, be accompanied by "*I think*" and, indeed, the "*I think*" can be thought of as expressing this necessary unity of consciousness – as expressing, that is, the connectedness of our representations and thoughts which, or so Kant is claiming, is a prerequisite for any representation of an object (Longuenesse, 2019: 160-161). And this, it might be observed, hints at the link which Kant does indeed find between the unity of consciousness as encapsulated in the self-ascription of experiences and, as was mentioned in the previous paragraph, the claim that coherent perceptual experience is necessarily experience of objects falling under particular concepts. The link arises, in particular, because, for Kant, the fundamental conditions which allow for the recognition of particular contents of experience as falling under particular concepts are the very same conditions as allow for the possibility of the requisite self-ascription. This is because, in deploying the concepts as a means of classification, we inevitably introduce a certain unity, or connectedness, into the objective world which, on Kant's account, certain of our states of consciousness are taken to be perceptions of. It then follows from this that the contents of a subject's putative experience acquire a certain unity, or connectedness, too. Hence, a subject's temporally-extended series of states of consciousness comes to yield a picture of a unified, objective world of which (some of) these states are perceptual experiences. This permits the subject to recognise a distinction between the order of their experiences on the one hand, and the order and arrangement which the (external) objects of those experiences independently exhibit, on the other. And this allows the subject to countenance the notion of alternative experiential routes through the spatio-temporal objective world – possible routes which are different to their own. In doing so, they come to privilege one experiential route as their own experiential route, thereby self-ascribing their temporally-extended series of states of consciousness. And, crucially, in effecting this self-ascription of the series of states, they are, on Kant's account, thereby securing self-consciousness. We can see, therefore, that, in

⁵³ For simplicity, I will, in this thesis, speak in terms of the Kantian "*concepts*" rather than also bringing in the "*categories*" (A76-83/B102-116) and the "*schematism*" (A137-147/B176-187).

locating self-consciousness in the potential for the self-ascription of a temporally-extended series of experiences, Kant is also appealing to the notion of some kind of continuant, persisting subject – a continuant, persisting subject with the capacity to self-ascribe a temporal series of mental events which is (thereby) unified in consciousness (A84-95/B116-127, B128-129, A95-130, B129-169, A216/B262; Strawson, 1966: 26-29, 32, 37, 121-122).

It might be thought that, in arriving at this depiction of a continuant, persisting subject with the capacity to self-ascribe a temporal series of mental events, Kant has already provided a pretty comprehensive account of a “person”. But care is needed. Thus far, the analysis has been in terms just of selves, and subjects, rather than of persons. And, in contrast to Hume, Kant draws a distinction between selves/ subjects and persons, as is indicated at the beginning of the *Critique*’s “Third paralogism of personality” (A361-366/B408) where Kant states that:

“What is conscious of the numerical identity of its Self in different times, is to that extent a person” (A361).

The consilience with Locke, as suggested above, is, I think, very clear.

The distinction which Kant is drawing between selves/ subjects and persons is a subtle one. Any meaningful experience presupposes, as we have seen, a persisting subject with the ability to self-ascribe such experience. More generally, we can put it that, for Kant, it is a necessary condition of our engaging in any thinking whatsoever that thoughts be attributed to a self (B131-132). Accordingly, if Kant were to “*enter most intimately*” into his mental activities in the fabled Humean fashion noted in section 8.3 (T 1.4.6, 252), we might expect him to catch a glimpse of rather more than does Hume – something, indeed, more akin to what would be available to the Cartesian.

Crucially, however, Kant does not follow the Cartesian in supposing that self-consciousness is sufficient to underpin the numerical identity over time presupposed in the notion of a *person* (A348-351, B407-408). A persisting *self*, this is to say, does not a persisting *person* make – or not necessarily, anyway (A351-361/B407-408). As Kant expresses this:

“... in every judgment I am always the determining subject of that relation that constitutes the judgment. However, that the I [which thinks]... can always be considered as [a] subject... does not signify that I as object am for myself a self-subsisting being or substance. The latter goes very far, and hence demands data that are not encountered at all in thinking” (B407).

Thus, whilst, at any given time, it is a “*logical*” (A356), or “*formal*” (A363), requirement that statements of self-ascription point continuously to one “*I*” – to one subject, or self – this does not, in and of itself, guarantee that there actually does obtain a *person*. And whether or not there actually does obtain a person is not something we can learn from the data of consciousness alone (Bxli, A107, A355, A362-363).

What lies behind Kant’s concern here? After all, self-consciousness, defined in terms of an ability to self-ascribe a temporally-extended series of mental states, has been seen to play a critical role in his account of experience and would seem to be a notion carrying quite some force. Indeed, as Kant himself notes: “*The identity of person is... inevitably to be encountered in my own consciousness*” (A362). So what’s the problem? Why doesn’t the numerical identity of a person necessarily spring forth from a persistent, self-conscious self? Kant finds the answer to this in an analogy. Just as: “*An elastic ball that strikes another one in a straight line communicates to the latter its whole motion, [and] hence its whole state*”, so, too, could a steadily-accumulating series of consciousnesses be transferred from one agent to another, and thence to another, etc., such that the last agent in the sequence would be able to self-ascribe the mental states of all of the previous subjects whilst, unbeknownst to this last agent, not being the same *person* as any of them (A363-364 (footnote)). Accordingly, a “*continuing consciousness*” is not necessarily the continuing consciousness of a *person* (A 365). Self-consciousness as Kant defines it, this is to say, is not sufficient to delimit personhood since it is not necessarily rooted in a *single* continuant self. The Kantian “*I*” can wander, such that, in Derek Parfit’s terms, the last agent in the sequence might have a consciousness predominantly stocked with third person “*quasi-memories*” (Parfit, 1987: 220). And, with reference to section 8.3, whilst the “*real connexion[s]*”, both psychological and causal, between the various agents might have been sufficient for Hume (had he been able to “*perceive*” them, anyway), they do not secure personhood as far as Kant is concerned (T Appendix, 636). Rather, for Kant, a person is not merely a self or a subject, but is a self or a subject which *abides* in the sense of being the seat of one and the same consciousness, and of only that one and the same consciousness, throughout its temporally-extended existence (A364). It is a self, or a subject, we might put it, which is the proprietor of a single, and a cohesive, point of view.

On this basis, what Kant still needs to identify if he is to provide a comprehensive account of personhood is, as Evans has expressed it in a related context: “... *the way in which we know, when we think of ourselves, which object is in question*” (Evans, 1985: 318). (Recall from above: “*What is conscious of the numerical identity of its Self in different times, is to that extent*

a person" (A361).) And the solution to this, as we have seen Kant to contend, cannot be discovered only through introspection involving the data of consciousness. In particular:

"... the identity of the person, by which would be understood the consciousness of the identity of its own substance as a thinking being in all changes of state, [is not to be found in] ... a mere analysis of the proposition 'I think' " (B408).

Rather, if we are to secure a notion of personhood, then, instead of just peering inwards, what we need also to do is to "look outwards" and, in doing so, appeal to notions of *objective* identification and re-identification – notions which, ordinarily, we apply to *external* objects. Furthermore, in order to achieve this, we will need to appropriate the viewpoint of the external, third party observer (A362).

Kant expands on this by noting the similarity between how each of us might recognise, through experience, the continuing numerical identity of an external object, and how it is that we ourselves might be experienced as persisting through time by another person, namely: "... as an object of his outer intuition" (A362). Crucially, he then suggests that, if we are to know of *ourselves* as a person persisting through time, then each of us must, ourselves, also adopt the standpoint that the third party observer takes to us. It is only in this way that one can confirm that what one takes to be the sequential mental states of one and the same entity (i.e., of oneself as a person) really do belong to one and the same entity (to oneself), rather than one's simply being the last elastic ball in the queue. Invoking empirically applicable criteria of identity in this way (as one might ordinarily do with an external object) thus provides us with what the mere connectedness of *inner* experience cannot – namely, the knowledge that one is the *one and the same* numerically identical person (A361-365; Strawson, 1966: 162-169). Importantly, this is not to say that Kant is positing an identity between the human body (*qua* "external object") and the person. Indeed, he is clear that the body is "*outside*" the person, just as is any other external object (B409; cf. A342/B400, B415). However, absent the body, conscious awareness of one's continuant personhood would not, he tells us, be possible (B409, cf. B275). Hence, the point seems to be that it is in virtue of our experiencing ourselves as embodied (as "*a human being*", as a third party might experience us (B409)) that the means by which we divine continuing numerical identity in external objects can be applied to the task of informing us of our own continuing numerical identity as a person (A361-362). Thus, "same body" does not entail "same person", but it does, at least, provide a means for one to come to know of oneself as that same person. To know of oneself as a Kantian person, then, is to know of oneself as an *embodied consciousness* (B409, cf. B275).

Kant's account of persons as embodied consciousnesses might therefore be summarised by saying that being a continuant person, or what he also calls an abiding self, involves awareness of oneself as a self in a mind-independent external world of which one is a part, coupled with an awareness that one's course of perceptual experience is determined by encounters with that mind-independent external world – a depiction which continues to infuse accounts of persons as embodied consciousnesses in the modern day (as noted in section 8.4, more recent versions of this kind of account have been offered by Strawson (1959; 1966), and by Cassam (1997)). A further aspect of these accounts is generally that the experiencing subject is held to take it to be the case that their perceptual experience is determined by encounters with a mind-independent external world because, following a process of reasoning, they come to think of perceptual experience as being evidence for how the external world is – and how it is irrespective of whether they perceive it or not. (This process of reasoning is perhaps not fully understood, but involves notions such as inductive reasoning, and inference to the best explanation – see also section 8.7.) Since the external world is thus found to obtain independently of their perceptions of it, the experiencing subject, in terms of such accounts, comes to recognise that their particular course of experience reflects both how the world is, and how they, from their subjective point of view, contingently engage with it. In thus recognising that they are the proprietor of one particular, contingent course of experience, the notion of a particular continuant self with a particular point of view on the external world “... *swims into [their] ken*”⁵⁴ as they self-ascribe their own particular temporally-extended sequence of conscious mental states and, thereby, attain self-consciousness.

8.6 Change as an essential prerequisite of accounts of persons as embodied consciousnesses

Why might one claim that Kant's account of persons, and accounts of persons as embodied consciousnesses more generally, essentially involve metaphysically significant Change? A first argument to this effect can be derived from the point mentioned in section 8.5 that, on Kant's account, experience is necessarily temporally successive. This arises, Kant tells us, from time's being “...the *a priori* formal condition of all appearances in general” (A34/ B50). There simply cannot be, this is to say, a mental state that is not in time. As Kant expresses it:

⁵⁴ From the sonnet *On First Looking into Chapman's Homer* by John Keats (1816).

“... all of our cognitions are in the end subjected to the formal condition of inner sense, namely time, as that in which they must be ordered, connected, and brought into relations” (A99, *cf.* A34/B51).⁵⁵

There is more to this, however, than merely the order of our subjective experiences, and the temporal relations between them. It was said in section 8.5 that, as part of the attainment of personhood on Kant's account, the experiencing subject comes to recognise that their particular experiential route through the external world is just one, contingent, experiential route through that world. Connectedly, the subject also comes to recognise that their series of perceptual experiences is dictated by the order and arrangement which the contents of the external world independently exhibit. And this order and arrangement which the contents of the external world independently exhibit should not be thought of as being just a spatial order and arrangement. Rather, for coherent experience to obtain, it is necessary that it is also a temporal order and arrangement. That this is the case is, indeed, much stressed by Kant. On Kant's account, the component experiences comprising a complex mental state (a momentary state including, say, memories, as well as current perceptions) are presented to us as a simultaneity, the various elements being temporally indistinguishable (A99; A183/ B226; A215/ B262). Hence, if a succession of experiences is to be experienced *as a succession*, we will need to invoke something else with which the succession of experiences can be correlated. And what we do invoke is the objective temporal order of the worldly happenings of which we are having experiences. Thus, coherent experience necessarily involves temporal succession which, if we are ever to engage with it, must be recognised as being predicated upon the objective temporal ordering of the external world (Strawson, 1966: 50, 126-127).

This thought can be over-lapped with the further thought that, in recognising that the subjective temporal ordering of their perceptions is predicated upon (indeed, is parasitical upon) the objective temporal ordering of events in the external world, the experiencing subject will concomitantly recognise that, for an event to be available, temporally speaking, to their experience at all, that event must be appropriately temporally located in an objective sense (just as it would have to be appropriately spatially located in an objective sense). That Kant's thinking is, indeed, along these lines can be seen from his description of our looking, intermittently, at a ship pursuing a steady course along a river. It is apparent to us, he claims, that our various perceptions of the ship could not have occurred other than in the order in which they did occur. As such, it is apparent to us that the subjective order of our perceptions

⁵⁵ Kant's assertion in this regard bears comparison, I suggest, with J.M.E. McTaggart's quote in section 3.2 (footnote 10).

is grounded in an objective order. And this is also to recognise that our having perceptual experience of the ship at all depends upon its being appropriately temporally located in an objective sense (A192/B237).

This point can be underlined by recalling that, as was seen in section 8.5, one aspect of the attainment of personhood is, on Kant's account, the adoption by the subject in question of an external, third party viewpoint to themselves. And Kant tells us in this regard that it is in adopting this quasi-third party viewpoint that a subject is able consider themselves (as would a third party observer) as living out their biography "*in time*" (A362, B275).⁵⁶ Interestingly, the notion of time which Kant is deploying here is, he tells us, an objective notion, rather than time's being the time applicable to the subjective temporal ordering of perceptual experience (B275). Accordingly, it can be seen that Kant is explicitly invoking both what I have been calling *objective time*, and also what I have been calling *subjective time*. And, in the context of personal identity, it can be seen that, on Kant's account, objective time has a key role – personal identity over time, indeed, being presented as an essentially objective notion (A362-363, B275-276). A subject thus needs to embrace the quasi-third party viewpoint if they are to be able to be conscious of their identity as "... *determined in time*" in the required sense (B275, cf. Bxli). In this context, it should be noted that Kant's appeal to what I have been calling objective time and subjective time is not made so as to suggest that objective time, and subjective time, are two different times. Rather, in the same way as the terms have been used in chapter 6, the two notions are, on Kant's account, merely two ways of describing the one and only time. Indeed, Kant is very clear on this. In the case of a conscious perceptual experience, he tells us, the relevant state of consciousness, its content, and the (external) object which it involves must all be temporally located in the same time-line. Otherwise, perceptions would "... *be related to two different times, in which existence flowed side by side, which is absurd*" (A188/B232). In consequence, for Kant, the time-line of our subjective states, and the time-line of the objective world which they reference, must be one and the same time-line. "... *[T]here is...*" as he expresses it: "... *only one time, in which all different times must not be placed simultaneously but only one after another*" (A188-189/B232) (Bardon, 2010: 66-68). Interestingly, therefore, just as, for Evans (section 6.1), conscious perceptual experience presupposes the identity of objective and egocentric space, so, for Kant, does it presuppose the identity of objective and subjective time (Evans, 1982: 157-159).

⁵⁶ In this sense, the attainment of personhood can be thought of as requiring both what Bertrand Russell calls a subjective, "*lived biography*", and also an objective, "*official biography*", from the perspective of which the lived biography might be described (Russell, 1915(b): 414).

To this point, then, it can be said that, on Kant's account, a prerequisite of a subject's undergoing a temporally-extended course of perceptual experience which is experienced as being both coherent and successive is that the subject recognise that the subjective temporal order of their experience is predicated upon (indeed, is parasitical upon) the objective temporal order of the events in the external world. Relatedly, the subject will recognise that, for something to be experienced at all, it must be appropriately temporally located in an objective sense. And the intelligibility of the subject's experience also depends on their understanding that the time-line applicable to the subjective temporal sequence of their experiences, and the time-line applicable to the objective worldly events which their experiences reference, is one and the same time-line. This analysis does, I think, bear further comparison with Evans's spatial account. It was said, in section 6.1, that, according to Evans, in circumstances where an experiencing subject has aligned their cognitive map with their egocentric space, then for that subject to locate an object in egocentric space just is for them also to locate it in objective space (Evans, 1982: 162). Equivalently, we can see that, for the Kantian subject, one aspect of successful experiencing is that they find the subjective temporal location of a perception to be identical with a corresponding determinate objective temporal location.

Thus far, however, what has been said might not seem to require anything as regards an objective ordering of worldly events beyond what is provided within the terms of the B-theory. After all, the B-theory straightforwardly accommodates objective temporal locations, and a sequence of B-theoretic objective temporal locations could, presumably, be conformed in a subject's experience with the subjective temporal locations of their perceptions. Why, therefore, need it be thought that Kant's account involves metaphysically significant Change in a way that the B-theory does not? I will now argue that Kant's account does, indeed, involve metaphysically significant Change.

To say, first, in this regard, there are indications in Kant's account that his system, construed purely at the empirical level, does involve a world which is objectively A-theoretic. One indication of this is Kant's description of changes in the properties of objects which, Kant claims, involves the "... *transition [of an object] from one state into another*" (A188/B231). As such, it is also a description of change which is fluid, change in which one state of affairs oozes across into the next. And this, I suggest, as was said with regard to John Campbell's direct realist account in section 7.5, is in keeping with the world as it is depicted by the A-theorist – a world in which changes in the properties, or in the positions, of objects are dynamic and *legato*, rather than consisting in a series of states which are, themselves, eternal and changeless, as they would be characterised by the B-theorist (Dainton, 2010: 38-41; Prosser, 2016: 10, 183-184)..

A further argument to this effect can be derived from Kant's analysis of a subject's experience of an ongoing process. As Kant notes, there must be something about our experience of a process, such as, in his example, counting a number of objects, which renders it a *process*, rather than its merely comprising a sequence of discrete experiences (A103). In particular, there would seem to be a requirement that we know both that we are in a process, and that we know where we are in that process at any time.

To this end, Kant suggests that the complex representations associated with the experiencing of an ongoing process must be progressively constructed over time. As such, the individual acts of counting must be experienced as connected, accumulative acts of which the current act of counting is the culmination. Knowing that one is involved in a process, this is to say, requires that prior elements of the process be experienced as having contributed to the experience of the current element. And, crucially, this accretive aspect of a process cannot be captured tenselessly. Rather, the prior elements of the process must be experienced as being, relative to the subject's current indexed temporal location, elements which are *past* elements. Knowing that one is involved in a process, and knowing where one is in that process, thus requires not only that elements of the process are experienced as *present*, but also that elements of the process are experienced as *past* (A103, cf. A183/B226). As the process continues, what was present becomes past, such that we locate ourselves in a sequence of sliding A-determinations. The subjective time-line is, therefore, an A-theoretic time-line. And, since, in terms of Kant's account more generally, we take our experience to be correlated with how the objective world is, then the objective time-line (which is, after all, one and the same with the subjective time-line) is A-theoretic, too (Bardon, 2010: 65, 68-70). As such, on Kant's account, our experience can be said to depend, for its coherence, on metaphysically significant Change.

Furthermore, it has been said above that coherent experience in part depends upon an experiencing subject's recognising that to have perceptual experience at all depends upon a worldly event's being appropriately temporally located in an objective sense. And, regarding accounts of persons as embodied consciousnesses in general, I think that it can be read into this that a feature of a subject's experience being coherent experience is that those worldly events which are appropriately temporally located in an objective sense are found to be essentially objectively *present* events. This reflects the thought that, in terms of accounts of persons as embodied consciousnesses, the experiencing subject simply couldn't make sense of the world if they didn't suppose that there are objectively future events, and objectively past events, which are inaccessible to direct experience. But what they can make sense of is a world in which an event which they can experience is an objectively present event. And they

can make sense of a world in which such experience as is immediately available to them changes as their temporal position changes – a world, their experiential route through which yields experience which changes as their temporal location within that world changes by pressing continuously forwards. On this basis, the person, characterised as an embodied consciousness, can, as required, coherently experience a world in which, for example, a previously merely potential event becomes, fleetingly, temporally available to them (i.e., an objectively *future* event becomes, fleetingly, objectively *present*). And this, of course, is, once again, a description of a world manifesting metaphysically significant Change.

Part 3 – Accounts of persons as embodied consciousnesses and a world which is objectively B-theoretic

8.7 Accounts of person as embodied consciousnesses and the subjective temporal frame of reference

I have claimed in section 8.6 that, in terms of Kant's account, the experiencing subject needs to represent the world as a world containing time, and as a world exhibiting Change. If we are to have an intelligible conception of the world, this is to say, we have no choice but to represent the world, and events in the world, as exhibiting the A-determinations. Time, and Change, just are aspects of reality that cannot intelligibly be questioned, or intelligibly supposed away. Indeed, Adrian Bardon goes so far as to suggest that Kant's claims amount to an undermining of the intelligibility of the B-theory. The B-theory, of course, posits a world without Change. But, in terms of Kant's account, we cannot posit a world without Change since we cannot intelligibly conceive of such a world in order then to posit it! In consequence, the B-theory can be said to be, in terms of Kant's account, literally unintelligible (Bardon, 2010: 73).

Despite this, however, we cannot straightforwardly say that Kant, in terms of his *overall* system, is an A-theorist. This is because, time, in terms of Kant's overall system, is not a part of ultimate metaphysical reality. Rather, for Kant, time is empirically real whilst being transcendently ideal (A35-36/B52). Bardon suggests that the best way to account for the empirical reality of time in this context is via a projectivist account. In particular, following a version of projectivism suggested by Peter Kail, the empirical reality of time can be characterised, Bardon suggests, as a kind of explanation – an explanation which explains an experiencing subject's commitment to the world being a certain way when it is not possible to invoke the world's being that way to explain that commitment. Further, on Kail's projectivist account, the commitment to the world being a certain way is not derived or sustained by

inference. Rather, the commitment is explained by appeal to psychological facts about the subject, albeit that the phenomenology of the commitment does not intimate to the subject the explanation for the commitment (Kail, 2001: 27-28). Commitments to the world being a certain way just are explained by the experiencing subject's being in a certain psychological state, not by any facts corresponding to that commitment (Bardon, 2010: 62-63).

I agree with Bardon that this does successfully capture the relevant aspects of Kant's overall account, and provides an effective way of accounting for the empirical reality of time which is transcendently ideal. However, if Kant's account is considered just at the empirical level, as I have been doing, it is not necessary to square the circle via an appeal to projectivism in this way (any more than it would be with other accounts of persons as embodied consciousnesses such as Strawson's (1959; 1966), or Cassam's (1997)). Accordingly, I propose to take it for my purposes that Kant's account of the empirical person, considered just at the empirical level, is most straightforwardly to be thought of as presupposing an A-theoretic account of time, and hence as presupposing objective, absolute Change as it is presented in the A-theory. That having been said, however, I have proposed, based on the arguments of chapters 3 and 5, that the world is a world which does not contain mind-independent, objective, absolute Change and is, in this sense, a world which is objectively B-theoretic – a proposal which, if correct, is, at first sight, to the detriment of Kant's (empirical) account, and to accounts of persons as embodied consciousnesses more generally. But what I now want to suggest is that the metaphysically significant Change which, I am claiming, is an essential prerequisite of accounts of persons as embodied consciousnesses need not be secured via an appeal to a world which is objectively A-theoretic. Rather, that metaphysically significant Change is to be secured with reference to the subjective temporal frame of reference.

With this in mind, it is of interest to return briefly to Kant's ship, pursuing its steady course along the river (section 8.6). Kant's analysis of our experience of the ship is, in part, intended to demonstrate a difference between our experience of events (such as the ship's moving), and our experience of objects (such as a house). It was said in section 8.6 that it is apparent to an experiencing subject intermittently looking at the moving ship that their various perceptions of the ship could not have occurred other than in the order in which they did occur. However, in contrast, one could look at the various parts of a house without gaining any equivalent impression. In the case of a house, that is, our perceptions of its various parts could, we take it, have occurred in any number of orders. What constitutes the difference between the ship's moving, and the house? Kant's claim is that the difference arises because the stages of the event of the ship's moving are causally-related. And, since causation is one of the Kantian concepts which we possess *a priori*, we therefore come to represent the event-

stages of the ship's movement as being such that their (objective) order is mandated by the law of causality. Concomitantly, we represent the (subjective) order of our perceptions of the ship as being such that we could not have had them in a different order. Since the various parts of the house are not relevantly causally-related in the same way, however, no equivalent considerations arise in terms of our perceptions of them (A190/B235-A193/B238; Bardon, 2002: 140-144).

Might this appeal to causation survive the transition into a world which I am claiming to be objectively B-theoretic? I suspect, in fact, that it would not. Given the notion of the B-theoretic static time-line (section 2.5), B-theoretic causal relations between event-stages can be thought of as consisting just in strong statistical correlations between adjacent stages which sit timelessly next to each other on that time-line. And, I suggest, causation of this kind would be inadequate to ground the distinction between events and objects which Kant is seeking to establish. This is because, if causation is to ground such a distinction, then, since it must distinguish one set of discrete entities (a sequence of event-stages) from another set of discrete entities (the parts of an object), it must, in the case of the event-stages, capture (using Kant's terminology) the "*transition*" (A208/B253) of one event-stage into another, and of event-stages "*arising*" (A207/B252) as they are "*determined*" (A195/B240), or brought about, by prior event-stages. But, as noted in section 8.6, this kind of fluidity is no part of the B-theoretic world (indeed, Kant's terminology here suggests further that, at the purely empirical level, his world is a world which is objectively A-theoretic). Accordingly, based on causation alone, we would have no reason to represent events as events, rather than merely as a motley collection of disconnected entities. (This aspect of the B-theoretic world is essentially what ruled out the viability of a tenseless representation of an ongoing process in section 8.6.)

In place of Kant's depiction of causation, however, what can be fruitfully considered is the postulation from section 8.6 that, in terms of accounts of persons as embodied consciousnesses, coherent experience depends (in part) upon an experiencing subject's recognising that to have perceptual experience at all depends upon some worldly event being appropriately temporally located in an objective sense, together with the associated understanding that those worldly events which are appropriately temporally located in an objective sense are those events which are essentially objectively *present* events. Relatedly, it was said in section 8.6 that the coherence of experience depends on other worldly events being, in relation to an experiencing subject, objectively *future* events, or *past* events, since one couldn't make sense of the world in accordance with accounts of persons as embodied consciousnesses if it were not supposed that there are future events, and past events, which are inaccessible to direct experience. This, of course, was all said in the context of a world

which was being taken to be an objectively A-theoretic world. And it is, as it were, easy to say all of this in a world which is taken to be an objectively A-theoretic world since such a world is, of course, a world involving objective metaphysical futurity, presentness, and pastness, and objective, absolute Change. Having proposed that the world is a world which is objectively B-theoretic, however, I cannot appeal to these objective metaphysical A-theoretic features of the world. But what I can appeal to is the subjective “*now*” – i.e., the subjective “*now*” situated at the temporal location of an experiencing subject’s point of view, and which stands in the impermanent temporal relations of futurity, presentness and pastness to worldly events. And, in making an appeal to the subjective “*now*”, the postulation that coherent experience depends upon the experiencing subject’s recognising that to have perceptual experience of an event at all depends upon that event being an essentially objectively *present* event is to be parsed as meaning that the event must, temporally speaking, coincide with that experiencing subject’s subjective “*now*”. And the essential objective sense in which that event is *present* is secured, not by an appeal to objective metaphysical A-theoretic features of the world, but by the metaphysical significance of the subjective “*now*” with which that event coincides, and which corresponds to the temporal location of the point of view of the experiencing subject. The objective world, then, in virtue of being B-theoretic, has failed to provide objective, absolute Change. But the metaphysically significant Change essential to accounts of persons as embodied consciousnesses is, I propose, secured in virtue of a metaphysically significant subjective “*now*” residing at the temporal location of an experiencing subject’s point of view which stands to that objectively B-theoretic world and its events in relations of futurity, presentness, and pastness. Equivalently, it is secured in virtue of a metaphysically significant subjective temporal frame of reference which has, as its point of origin, that subjective “*now*”. Thus, in similar vein to what was said as regards direct realism in section 7.6, if the experiencing subject, as characterised in terms of accounts of persons as embodied consciousnesses, is real, then so is their subjective point of view and so, therefore, is the subjective temporal frame of reference.

This argument can also be put in epistemological terms. From section 8.5, we can say that, in terms of accounts of persons as embodied consciousnesses, an experiencing subject’s awareness, or knowledge, of themselves as a person requires, in part, knowledge that the contingent course of their conscious perceptual experience is determined by encounters with a mind-independent external world of which they are a part. This depiction is very much aligned, I suggest, with what was said with regard to direct realism in sections 7.5 and 7.6, namely that, as least as direct realism is characterised by Campbell, conscious perceptual experience essentially involves an awareness on the part of the experiencing subject of their own, subjective location (both spatially, and temporally, speaking) within the objectively

determined layout of the environment of which they are a part and on which their perceptions depend. Furthermore, both for proponents of accounts of persons as embodied consciousnesses, and for direct realists, our knowledge of the mind-independent external world begins with such conscious perceptual experience, from which comes perceptual knowledge which is then raised to the level of our knowledge of our best theory of that mind-independent external world. And, crucially, on the assumption that the world is objectively B-theoretic, the requisite conscious perceptual experience in terms of both kinds of accounts presupposes, I have claimed, a metaphysically significant subjective temporal frame of reference.

With regard to accounts of persons as embodied consciousnesses, it can therefore be said that an epistemological claim about the experiencing subject's having knowledge of themselves as a person, and having knowledge of the mind-independent world, transmogrifies into a metaphysical claim about the metaphysical significance of the subjective temporal frame of reference which such knowledge presupposes. With regard to direct realism, an epistemological claim about the experiencing subject's knowledge of the "*categorical*" (Campbell, 2002: 137), and of the mind-independent world (see section 7.5), transmogrifies into a metaphysical claim about the metaphysical significance of the subjective temporal frame of reference which such knowledge presupposes. In neither case, on the assumption that the world is objectively B-theoretic, could the knowledge which the respective accounts involve get off the ground without the metaphysically significant subjective temporal frame of reference serving to underscore the conscious perceptual experience, as it is characterised by those accounts, from which such knowledge is spawned.

Part 4 – The nature of the experiencing subject

8.8 The experiencing subject *qua* experiencing subject

It has been said over the course of the preceding chapters that an experiencing subject can be thought of as occupying a subjective temporal frame of reference, the point of origin of which is constituted by the subjective "*now*" corresponding to the temporal location of their point of view. In what further ways, though, is the nature of such an experiencing subject to be understood?

It can first be said in this regard that, included among those events occupying fixed positions on the static B-theoretic time-line, are each episode of this experiencing subject's

experiencing. In this way, the experiencing subject is, as would be expected, implicated in the B-theoretic, objective world – a world in which the experiencing subject will also participate *qua* corporeal object.

Also relevant are the notions, first referred to in section 6.2, of “objective time” and “subjective time”. These have been said to be merely two depictions of one and the same time – two depictions reflecting one and the same time as it is characterised, respectively, in terms of the objective, and in terms of the subjective, temporal frame of reference. The idea, loosely expressed in section 4.2, of the experiencing subject “scuttling along... atop the static, B-theoretic objective time-line, in the direction of later and later events” is then to be understood as that subject, located at their successive subjective “*nows*”, standing to events embedded in the static B-theoretic time-line in the impermanent relations of futurity, presentness, and pastness – standing to those events, that is to say, in the relations in terms of which the subjective temporal frame of reference is defined. In this sense, the experiencing subject, and the subjective temporal frame of reference, are in motion relative to the B-theoretic time-line. And what can also be seen from this, I suggest, is that, whilst we have in play two depictions of one and the same time, the subjective depiction of time is essentially derivative upon the objective depiction (the objective depiction would, after all, be realised in a world lacking experiencing subjects occupying subjective temporal frames of reference in a way that the subjective depiction would not).

It has been claimed in chapter 7, and in this chapter, that, with reference to direct realism and to accounts of persons as embodied consciousnesses, the subjective temporal frame of reference, and the relations of futurity, presentness, and pastness in which the experiencing subject stands to events embedded in the static B-theoretic time-line, are to be accorded metaphysical significance. Now, as has been said, each episode of an experiencing subject’s experiencing constitutes an event which occupies a fixed position on the static B-theoretic time-line – a time-line in which the subject also participates *qua* corporeal object. However, in standing to the static B-theoretic time-line in metaphysically significant relations of futurity, presentness, and pastness, what we might think of as the experiencing subject *qua* experiencing subject (the experiencing subject *in and of herself*), is, I suggest, with reference to these accounts, essentially removed from that static B-theoretic time-line. Indeed, in section 8.5, this idea has already been seen, as it is exemplified in Kant’s account of persons as embodied consciousnesses, in Kant’s claiming that the body is “*outside*” the person in the same way as is any other external object (B409; cf. A342/B400; B415). Furthermore, it is this idea that underlies the claim in section 6.4 that the elusive entity which J.M.E. McTaggart suggests would be a prerequisite of Change is to be identified with the successive subjective

“*nows*” which the experiencing subject sequentially occupies – this entity being, as McTaggart puts it, “*outside the time-series*” (here to be understood as outside the *objective* time-series) (McTaggart, 1927: §327). In contrast, in the case of, for example, functionalism, the functionalist subject was described in section 8.2 as being a participant in the causal episodes arrayed along the B-theoretic time-line. If this amounts to a relevantly complete description of the functionalist subject, then such a subject is not essentially removed from the B-theoretic time-line in any equivalent sense, the relations of futurity, presentness and pastness in which they stand to events embedded in that time-line having a merely psychological significance.

This characterisation of the experiencing subject occupying a metaphysically significant subjective temporal frame of reference as being essentially removed from the static B-theoretic time-line is, I believe, consistent, not only with Kant’s account of persons as embodied consciousnesses, but with such accounts more generally. In Kant’s case, an appeal is made to the soul (A342/B400). But this characterisation is also consistent, I suggest, with the concept of a person provided by Strawson in his embodied consciousness account. Within this account, Strawson describes the concept of a person as a “*primitive... concept*” which contains two aspects – the mental and the bodily – such that both predicates which ascribe states of consciousness and, in addition, predicates which ascribe corporeal characteristics and physical situations, are “*equally applicable*” to it (Strawson, 1959: 102). The characterisation of the experiencing subject proposed above does not, I believe, conflict with this dual-aspect formulation.

As a closing thought, in attributing metaphysical significance, at least with reference to certain accounts of experiencing subjects, to the relations of futurity, presentness, and pastness, the account proposed in this thesis is to be categorised as a tensed theory of time. In chapters 3 and 5, certain arguments from philosophy, and from the physical sciences, were said to tell against the tensed theories of time which collectively comprise the A-theory. Whilst, in chapter 5 (in particular, in sections 5.6 to 5.10), I have suggested that the proposed account is not ruled out by those aspects of relativity theory seen, in that chapter, to tell against the A-theory, it remains, I believe, to demonstrate that the proposed account is also not ruled out by the philosophical arguments brought to bear against the A-theory in chapter 3 – in particular, that it is not ruled out by McTaggart’s Paradox. I will also, at the end of this section, touch on the issue of truthmakers of tensed sentences – something said in section 3.4 to also arguably present problems for the A-theorist.

McTaggart’s Paradox, as was seen in sections 3.1, 3.3 and 3.5, rests on the claim that Change involves a contradiction, since for an event to be future, to be present, and to be past would

involve that event in ways of being which are incompatible (provided, at least, that the three tenses are held to be “*ontologically significant*” (Bourne, 2006: 75)). The instinctive riposte that no one is asserting that an event is future, present and past *at the same time* was seen to culminate in a vicious, infinite regress.

How, though, might these arguments impinge upon the proposed account, which does posit “*ontologically significant*” relations of futurity, presentness, and pastness? One way to look at this is to expand upon the instinctive riposte by noting that, when we try to claim that no event is future, present and past *at the same time*, what we mean, of course, is that an event is first future, then present, then past. Now, this would not help the A-theorist, since this amounts to saying that the event is future *earlier than* it is present, and present *earlier than* it is past, which, as Nathan Oaklander notes, is simply to beg the question against McTaggart who, as set out in section 2.1, denies that the B-series (and, therefore, notions of earlier-than and later-than) can obtain prior to an A-series (Oaklander, 1987: 427-428; McTaggart, 1908: 461-464; McTaggart, 1927: §312; Bourne, 2006: 74). The proposed account, however, posits a world which, in not containing mind-independent, objective, absolute Change, is, in this sense, objectively B-theoretic. The objective world, this is to say, is a world mapped out in terms of the B-relations. The relations of futurity, presentness, and pastness have then been described as reflecting the way in which an experiencing subject stands to that objective world.

What this then means is that, in opposition to McTaggart’s position, in terms of the proposed account it is the B-relations of earlier-than and later-than, rather than the relations of futurity, presentness, and pastness, which are the fundamental relations. Indeed, in similar vein to what has just been said with regard to the experiencing subject *qua* experiencing subject, events stand to each other in the B-relations of earlier-than and later-than regardless of any consideration of experiencing subjects. As such, whilst they have been attributed metaphysical significance with reference to certain accounts of experiencing subjects, the relations of futurity, presentness, and pastness, in reflecting how experiencing subjects stand to the objective world, are, in terms of that objective world, relations which are derivative upon the B-relations.

To expand upon this derivative nature of the relations of futurity, presentness, and pastness, the experiencing subject is, as has been said, moving with respect to the B-theoretic time-line in virtue of the impermanence of the relations of futurity, presentness, and pastness, and is sequentially located at each of their successive subjective “*nows*”. On this basis, an event embedded in the B-theoretic time-line is (say) a *future* event if its location on the B-theoretic time-line is *later than* the moment of time on the B-theoretic time-line to which the experiencing

subject (located at a particular subjective “*now*”) stands in the relation of presentness. As that particular subjective “*now*” is succeeded by other subjective “*nows*”, the event will pass through being a present event, thence to be a past event (*past* events being those events which are *earlier than* the moment of time to which the experiencing subject stands in the relation of presentness). In other words, the event is first future, then present, then past – just as the instinctive riposte to McTaggart’s Paradox sought to claim. Equivalently, an event’s being future *earlier than* it is present arises because, for it to be a future event, the experiencing subject, located at a shifting subjective “*now*”, must be standing in the relation of presentness to moments of time on the B-theoretic time-line which are earlier than the event. The event’s being present *earlier than* it is past (i.e., its being past *later than* it is present) arises because, for it to be a past event, the experiencing subject must be standing in the relation of presentness to moments of time on the B-theoretic time-line which are later than the event. Accordingly, whilst the relations of futurity, presentness, and pastness are, in terms of the proposed account, metaphysically significant with reference to certain accounts of experiencing subjects, their being derivative upon the fundamental B-relations, coupled with the sense in which the experiencing subject moves relative to the B-theoretic timeline, secures, as was said with regard to presentism in section 3.5, the proposed account’s “... immunity to McTaggart’s argument” (Le Poidevin, 1991: 34).

The discussion above is compatible with (B-theorist) Mellor’s account of the truthmakers of tensed sentences in section 3.4. However, there arises, with reference to those accounts of experiencing subjects involving relations of futurity, presentness and pastness which are metaphysically significant, a need for a complex form of truthmaker which makes explicit the role of these relations (in particular, the role of the relation of presentness). With reference to section 3.4, an utterance “*b*” of the tensed sentence “*e* is past” is made true, for Mellor, by the fact that “*b*” is later than *e*. On the proposed account, in those cases where the relations of futurity, presentness and pastness are metaphysically significant, it is made true by the fact that, when making utterance “*b*”, the moment of time on the B-theoretic time-line to which the speaker stood in the relation of presentness is later than *e*.

Part 5 – Conclusion to chapter 8

8.9 Concluding comments

In this chapter, as in chapter 7, the intention has been to defend the idea that the posited subjective temporal frame of reference is, with reference to some, though not all, accounts of experiencing subjects, to be accorded metaphysical significance, such that the Change which obtains relative to it is, with reference to those accounts, to be accorded metaphysical significance, too. To this end, certain accounts of persons have been examined with a view to ascertaining whether or not they essentially involve metaphysically significant Change. I have argued in section 8.2 that functionalism does not essentially involve metaphysically significant Change and nor, from section 8.3, does the account of persons provided by Hume. In sections 8.5 and 8.6, however, I have claimed that the account of persons as embodied consciousnesses provided by Kant and, by extension, accounts of persons as embodied consciousnesses more generally, do essentially involve metaphysically significant Change. Kant's account, considered purely at the empirical level, is, I suggested, to be construed as being predicated upon an A-theoretic world, the Change which it essentially involves being objective, and absolute. This thesis, however, based on the arguments of chapters 3 and 5, has proposed that the world does not contain mind-independent, objective, absolute Change, and is, in this sense, a world which is objectively B-theoretic. But I have then suggested in section 8.7 that the metaphysically significant Change which is an essential prerequisite of accounts of persons as embodied consciousnesses is to be secured, not through an appeal to a world which is objectively A-theoretic, but through an appeal to the metaphysical significance of the subjective temporal frame of reference. Since functionalism, and the Humean person, have been said not to essentially involve metaphysically significant Change, this supports the claim from chapter 7 that, with reference to some, though not all, accounts of experiencing subjects, the subjective temporal frame of reference is to be accorded metaphysical significance. The chapter has further served to amplify the suggestion in section 7.7 that the metaphysics of mind, and the metaphysics of time, are correlated – something which points towards the possibility of a single theory of mind, and time, as a local holism. This analysis has also led to the claim, in section 8.8, that the experiencing subject situated at the point of origin of a subjective temporal frame of reference which is metaphysically significant is essentially removed from the static B-theoretic time-line in a way which, for example, the functionalist subject is not. A related argument was made to seek to demonstrate the immunity of the proposed account to McTaggart's Paradox.

9

Conclusions of the thesis

In this thesis, I have used the term “Change” to denote the movement in time of events from future to present to past. I argued in chapter 2 that all versions of the A-theory consider Change (or a variation thereof) to be metaphysically real – the metaphysical reality of Change being a primitive, mind-independent fact attributable just to the nature of time. However, despite the intuitive appeal of the A-theory, I have suggested in chapters 3 and 5 that there are a number of important arguments, both from philosophy and from the physical sciences, which tell against the A-theorist’s account of mind-independent, metaphysically real Change. Whilst these arguments might not be unanswerable, many philosophers find them weighty and they do, I suggested, lend support to the B-theory, a theory of time which presents Change as something which arises just with reference to an experiencing subject, and as being merely an apparent feature of an experiencing subject’s experience. In chapter 4, I characterised this B-theoretic depiction of Change as Change obtaining relative to a “subjective temporal frame of reference”, a frame of reference defined by the impermanent relations of futurity, presentness and pastness in which, in terms of the B-theory, the events embedded in the static B-theoretic time-line merely appear to stand to an experiencing subject.⁵⁷

This, however, led into the principal claim of the thesis. Whilst I have agreed with the B-theorist that Change is something which arises just with reference to an experiencing subject, I have claimed in chapter 3 that the B-theory, and the arguments which tell against A-theoretic mind-independent Change, overreach in seeking to rule out metaphysically significant Change *tout court*. This is because, I claimed, the question of the metaphysical significance of Change is best considered alongside a consideration of the nature of the experiencing subject. And I have claimed in chapters 7 and 8 that, with reference to certain philosophically respectable accounts of experiencing subjects, the subjective temporal frame of reference, and the Change which obtains relative to it, are, *contra* the B-theory, to be accorded metaphysical

⁵⁷ Whilst the version of the A-theory known as presentism was shown in chapter 3 to be immune to certain philosophical arguments which deny mind-independent, metaphysically real Change, presentism was said to arguably face specific difficulties regarding the truthmakers of past-tense sentences.

significance – metaphysically significant Change being an essential prerequisite of perceptual experience as it is characterised by these accounts. The accounts said to involve a metaphysically significant subjective temporal frame of reference in this way were direct realism, and accounts of persons as embodied consciousnesses. Correspondingly, I have claimed in chapters 7 and 8 that philosophically respectable accounts of experiencing subjects such as representationalism, and functionalism, do not involve a subjective temporal frame of reference which is to be accorded metaphysical significance, since metaphysically significant Change is not an essential prerequisite of perceptual experience as it is characterised by these accounts. If this is correct, it can be suggested, I have claimed, that there is a connection between the topic of the experiencing subject, and the topic of Change. This indicates that the metaphysics of mind, and the metaphysics of time, are correlated. Indeed, the principal claim which I have defended in this thesis is that mind and time are inter-defined, forming a local holism.

I have further suggested in chapter 8 that the experiencing subject participates in the static B-theoretic time-line *qua* corporeal object, and that each episode of experiencing by the experiencing subject constitutes an event which occupies a fixed position on that static B-theoretic time-line. However, in their occupying a subjective temporal frame of reference which is metaphysically significant and thereby standing to the static B-theoretic time-line in metaphysically significant relations of futurity, presentness, and pastness, I have claimed that the experiencing subject *qua* experiencing subject, as specified by direct realism and by accounts of persons as embodied consciousnesses, is essentially removed from that time-line. This characterisation of the experiencing subject is, I suggested, compatible with P.F. Strawson's dual-aspect concept of the person set out in his embodied consciousness account. Furthermore, this characterisation of the experiencing subject is, I claimed, also aligned with J.M.E. McTaggart's saying that a prerequisite of Change (if Change there be) would be an entity "*outside the time-series*" to which events would stand in the relations of futurity, presentness, and pastness (McTaggart, 1927: §327). I have suggested in chapters 6 and 8 that this entity is to be identified with the experiencing subject, such subject being, as has just been said, essentially removed, *qua* experiencing subject, from the B-theoretic time-line. More particularly, it is to be identified with the metaphysically significant successive subjective "*nows*" which, *qua* experiencing subject, the experiencing subject sequentially occupies – these successive subjective "*nows*" corresponding to the temporal location of that experiencing subject's point of view at the point of origin of the subjective temporal frame of reference. A related argument was provided in chapter 8 seeking to demonstrate that, despite positing metaphysically significant Change, the proposed account is, nevertheless, immune to McTaggart's Paradox.

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