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TIME, CAUSATION, AND THE LAWS OF NATURE: COMBINING THE GROWING BLOCK VIEW WITH A HUMEAN THEORY OF LAWS

SYD XIAO YANG

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Abstract

In this thesis I have two main concerns. The first is with the metaphysics of time, and the second is with the metaphysics of causation and laws. First, with regard to the metaphysics of time, I consider all the extant metaphysical view - (i) presentism, (ii) B-theory eternalism, (iii) the moving spotlight view, and (iv) the growing block view. By considering the historial and current literature on these topics in detail I argue that each of (i)-(iii) should be rejected, but that (iv) should be accepted. Then, with regard to the metaphysics of causation and law, by considering the arguments of David Hume, I argue in favour of a Humean view according to which the laws of nature supervene upon the temporal extent of what exists. This will then provide a challenge: can the growing block view of time be combined with the Humean view of causation and law? I finish by arguing that, despite the fact some have thought it problematic, these two views can be combined. I develop a novel account of how this is to be done, which I argue is the most satisfying account that has so far been given. In this thesis I thus defend growing block Humeanism, a unified view of time, causation and the laws of nature.

TABLE OF CONTENTS

Introduction

In this thesis I have two main concerns. The first is with the metaphysics of time, and the second is with the metaphysics of causation and laws. The two areas are nearly always dealt with independently of each other, but (as I will argue) they intersect at a crucial juncture. More specifically, there is a difficulty with combining certain views in the metaphysics of time with certain views in the metaphysics of laws. More specifically still, there is a difficulty with combining a view known as the growing block view in the metaphysics of time with a view known as Humeanism in the metaphysics of laws. I will argue in this thesis that both of these views are true, and so that this difficulty must be answered. And it is answering this difficulty that will form the major original contribution of this thesis.

I start, then, with an overview of the structure of the rest of the thesis as a whole. In giving this overview I will briefly mention the arguments that I will rely upon, but will not go into detail regarding them. As such, I do not pretend that in this introduction my view will be presented in a fully-formed way. But it should give the reader an idea of what that fully-formed view is. The rest of the thesis will then be concerned with fleshing out the arguments and my view in more detail.

The thesis can be thought of as being split into two broad sections. The first encompasses chapters 1-5, which deals with the metaphysics of time, and is of much greater length than the second, which encompasses chapters 5-6 and deals with the metaphysics of causation and laws. In the first section I argue in favour of the growing block view of time. In the second I argue in favour of the Humean view of causation and laws, and consider how this view can be combined with the growing block view. The first section is of greater length than the first because, in a certain

sense, unlike in the metaphysics of causation and laws, there can be no “direct” argument in favour of any metaphysical view regarding the nature of time. That is to say, there are many competing views in that area, and in order to establish which one is true, requires a careful examination of each, and their relative pros and cons. In the metaphysics of causation and laws, however, there is a direct argument available for the truth of one particular view (i.e. one that I endorse). So, in more detail then, the structure of this thesis is as follows:

In chapter 1 I consider the view in the metaphysics of time that is often thought to be the most intuitively plausible (i.e. the one most amenable to so-called “common sense”). This view is known as ‘presentism’, viz. the view that only the present time exists. I outline this view in detail and argue that it fails, because it is unable to account for the truth of past-tense sentences. That is, I rely upon an argument known as the Truthmaker argument, to reject presentism. So, this chapter has as its conclusion that presentism is false.

In chapters 2 and 3 I then turn to considering what is known as the ‘B-theory’ of time, a view according to which time itself does not in any sense have a genuine flow to it. In chapter 2 I argue that we have good reason to believe that time does indeed flow, and so argue that a theory which can explain this is more plausible than one that cannot. I argue further that the B-theory cannot explain this, but that the A-theory can, and so that the A-theory is more plausible in this respect. In chapter 3 I then bolster this argument by considering another fundamental aspect of temporality, i.e. the issue of how material objects persist over time.

At the end of chapter 3, I will have argued that presentism is false, and that the B-theory should be rejected. This will leave us with two A-theory views still remaining, the moving spotlight view, and the growing block view. The former view is the view that the past, present and future are all real, but that there is a privileged present moment that moves along the timeline such that, as time flows, different moments become successively present. The latter view is the view that the past is real, but the future is not, and that as time flows new states of reality come into existence. The present moment, on this view, is the last moment currently in existence, i.e. the "edge" of the growing block of time. In chapter 4, I consider the moving spotlight view, arguing that it fails because…

In chapter 5 I then consider the only view of time still remaining, i.e. the growing block view, and argue that it can overcome the problems facing the other views of time. I therefore conclude that this view is true.

In chapter 6 I turn my attention to the metaphysics of causation and laws. I focus on David Hume's argument… I consider and reject objections to Hume's account, and so endorse his argument and position. I thus conclude that a Humean theory of causation and the laws is true.

Finally, in chapter 7 I consider the issue of whether the growing block view of time can be combined with a Humean theory of causation and laws. I draw out a difficulty for this combination, and consider the one extant discussion of it due to Smart (2018). I then argue that Smart's account is problematic, because of the fact that he

compromises the Humean theory by accepting laws of nature, which turns out to be a serious threat.

Chapter 1

Against Presentism

Introduction

My focus in this chapter is on presentism. I argue that it fails because it cannot overcome what is known as 'the truthmaker objection'. I start with a brief presentation of the basic objection to presentism to be developed throughout this chapter:

Presentism, roughly speaking, is the view that only present things exist. According to the view, although present, past, and future tense sentences can be true, only the former is about the realm of existing things (which, of course, on their view is the realm of all there is). So, on this view, any sentences that contain terms (putatively) referring to past- or future- objects cannot be true, as they are not existing presently. However, this claim is apparently problematic because ordinarily we would say that past-tense sentences are about things that *did* exist. For instance, it is common sense that the dinosaurs once inhabited this planet, and so common sense that they *existed*. It is common sense to say, therefore, that past tense sentences that mention dinosaurs are *about* dinosaurs, and to say that dinosaurs are things that used to exist. That is, it seems we want to say there are some things, namely dinosaurs, that dinosaur-sentences are about, and that they are things that used to exist but do not now exist. So, given that presentists deny that such objects have any kind of reality,

it is hard to see how this can be so. On their view there simply is nothing that dinosaur-sentences are about.

I think this basic objection is, in the end, fatal to presentism. But in order to show why a more precise account of what presentism is needs to be given, and the objection developed in light of it. So, in section 1 I begin by getting clear about the meaning of presentism. Then, in section 2 I elaborate on the presentist's understanding of past tense sentences. In light of this, in section 3, I introduce the Truthmaker objection, and outline why the argument shows presentism is false. I endorse this conclusion in a preliminary fashion, but note that there are three possible responses that presentists could make to it. In sections 4-6 I consider these three objections in turn, and reject them. I then briefly conclude by rejecting presentism outright.

Section 1: Understanding Presentism

First, then, how are we to define presentism more precisely? The rough characterisation of the view given above can be captured as follows:

> Presentism: Only present things exist.

But what, more precisely, does this statement mean? In order to better understand this it is worth reflecting upon the opposing view of eternalism, which can be captured (again roughly) as follows:

Eternalism: Present things, past things, and future things exist.

The reason it is worth reflecting upon this is because there is a sceptical line of thought according to which there is no way to frame the disagreement between presentists and eternalists that makes it an interesting disagreement. According to this line of thought, presentists and eternalists must agree that their own view is obviously true and their opponents' clearly false, or vice versa. And, moreover, they must also agree that their apparent disagreement about particular examples is 'merely linguistic'. In more detail, the line of thought focusses on the term "exist" and argues that it is ambiguous between two different senses, but that no matter how the term is disambiguated, neither can express their views in a way that makes them in any way interesting - i.e. their views, even by their own lights, will come out as either obviously true or clearly false. And, in fact, no matter how the term is disambiguated, presentists and eternalists will actually agree with each other about the truth of all existence sentences, and

In order to appreciate this line of thought, consider that the two ways of disambiguiting "exist", according to this line of thought, can be presented in the form of a dilemma:

> Dilemma: When we say that something x *exists*, we either mean to use the present tense form of the word 'exists', and so if we put it more explicitly it means that x *exists now in the present*. Otherwise, we do not mean to use the present tense form of the word, but in such a case it covers all three tenses, and so if we put it more explicitly it means that *x existed in the past, exists now in the present, or will exist in the future*.

So, first, to see that this line of thought, if correct, means that there is no way of framing presentism or eternalism that makes them interesting views, consider that, if it is correct, we must understand the term ‘exists’ as given in the definitions of presentism and eternalism to be taken in one of these two senses, i.e. as expressing the present tense, or as covering all three senses. If we explicitly substitute them into the rough definitions given we get:

Presentism:

(i): Present tense use of “exists”: Only present things exist now in the present.

(ii): All tense use of “exists”: Only present things existed in the past, exist now in the present, or will exist in the past.

Eternalism:

(i): Present tense use of “exists”: Present things, past things, and future things exist now in the present.

(ii) All tense use of “exists”: Present things, past things, and future things existed in the past, exist now in the present, or will exist in the future.

The problem now becomes apparent. The definition Presentism (i) is an obvious truth that presentists and eternalists will both agree upon, and Presentism (ii) is a clear falsehood that presentists and eternalists will both reject. By contrast, the definition Eternalism (i) is a clear falsehood that presentists and eternalists will both reject, and Eternalism (ii) is an obvious truth that presentists and eternalists will both agree upon. So, either “exists” is used in the present tense sense, in which case

presentism is obviously true and eternalism clearly false, or it is used in the all tense sense in which case presentism is clearly false and eternalism obviously true. And crucially, presentists and eternalists will agree about this. So, there is no way to frame the debate that makes it an interesting one.

Second, to see that presentists and eternalists will actually agree with one another about the truth of all existence sentences, consider a specific example involving dinosaurs:

Dinosaur-sentence: Larry the dinosaur exists.

It is tempting to say that presentists will deny that this sentence is true because of the fact dinosaurs are not presently existing things, but that eternalists will think it is true because they think that despite not being presently existing things, dinosaurs do exist in the past. But, according to the line of thought we are considering, “exists” in this sentence must be understood in either the present tense sense or the all tense sense. Again, substituting them in we get:

Dinosaur-sentence:
(i) Present tense use of “exists”: Dinosaurs exist now in the present.
(ii) All tense use of “exists”: Dinosaurs did exist in the past, exist now in the present, or will exist in the future.

But, clearly, both presentists and eternalists will deny that reading (i) is false, and agree that reading (ii) is true. And so, if they do disagree, on this line of thought all that is happening is that presentists are reading the sentence in terms of (i) and

eternalists in terms of (ii). But then, they are not really disagreeing at all, but merely reading the sentence in two different ways. As this generalises to all “existence” sentences, it follows that presentists and eternalists do not really disagree about the truth of any “existence” sentences at all.

Now, I do not wish to argue that all of the above is right *if the line of thought presented is itself correct*. But I deny that the above line of thought is in fact correct. According to it, we *must* read the term “exists” in either the present tense or the all tense way. That is, according to it, there is *no other way* of reading the term “exists”. But this is false. There is another alternative way of reading the term “exists”, and that if we read the term “exists” in that way, then there is a way of framing the two views that makes them interesting, and a way of reading “existence” sentences upon which presentists and eternalists will genuinely disagree. To understand what this alternative reading is requires two steps.

The first step to understanding the alternative reading is to note that we sometimes use sentences in a *tenseless* way, i.e. in a way that is not supposed to be in the past, present or future tense. For example, this is plausibly so when we say that 2+2=4. In asserting this we do not mean to say only that 2+2=4 is true now in the present. But nor do we mean to say that it was true in the past, is true in the present, and will be true in the future. Mathematical truths are not the kinds of truths that are subject to temporal qualification, so what we mean to assert when we assert this is that 2+2=4 is, so to speak, *just true*. (Of course, this entails that they were true in the past, are true in the present, and will be true in the future, but this is not part of what we assert when we assert them.) So, the alternative reading of “exists” will involve the idea that existence-sentences can be read in a tenseless way, and are thus true iff it is tenselessly true that the thing in question exists.

The second step to understanding the alternative reading requires us to consider the notion of quantification. When we utter an “existence” sentence, we are saying that *there exists* some kind of object or other. We are therefore using existential quantification. But when we use existential quantification, what we are doing is considering a *range* of quantification, i.e. a domain or set of things, and we are saying that *within that range* there is something that is that kind of object. This idea is familiar to anyone who has done a first year course on logic. When interpreting an existential sentence we must first specify the domain of quantification, and then parse the sentence using the existential quantifier. For example, consider the following sentence:

Someone-sentence: Someone is tall.

As this sentence is usually interpreted, “someone” functions as a quantifier that is restricted to persons only, i.e. it has as its range the domain of persons only. Thus, the standard interpretation of it is as follows:

Domain: Persons

Translation: ∃x (Tx) [where ‘T’ stands for the property of *being tall*]

And so, when I say that someone is tall, my sentence comes out as being true only if there is some person within the domain that is tall. It is irrelevant to the truth of the sentence whether there is some other kind of thing outside of the domain that is tall, e.g. the Eiffel Tower.

What the above illustrates is that we often use restricted quantification - that is, the domain to which our quantifiers apply do not include absolutely everything that exists. But, we can also use quantifiers in an *absolutely unrestricted* way, i.e. in a way that includes absolutely everything that there is. Used in this sense, our quantifiers pay no attention to matters of tense, for existing in the past, present or future are not special ways of existing. If something exists in the past, for example, then it is tenselessly true that it exists.

Putting these two steps together, we can understand the term “exists” in the definitions of presentism and eternalism to be given in terms of absolutely unrestricted quantification, and therefore to be tenseless uses. This sense has been called “existence simpliciter” in the literature, and I follow suit here. Putting this explicitly in terms of quantifiers then, and substituting into our previous definitions, presentism and eternalism are to be defined as follows:

Presentism: Only present things exist simpliciter.
Eternalism: Past things, present things and future things exist simpliciter.

What is important here is that presentism and eternalism are now in opposition to each other, with neither of them being obviously true or clearly false. Moreover, both presentists and eternalists understand “exists” in the same way, but disagree with each other about the truth of certain sentences. Consider once more, the dinosaur sentence from above, now understood in terms of “existence simpliciter”:

Tenseless dinosaur-sentence: Larry the dinosaur exists simpliciter.

This sentence uses unrestricted quantification and so says that, if we consider the domain absolutely everything that there is, with no regard to matters of tense, Larry is amongst the things in the domain. And so, we now get a disagreement between presentists and eternalists. Eternalists will think this is true (assuming they have some particular past dinosaur in mind when they use the name “Larry”), but presentists will think that it is false.

It is in terms of existence simplicitier, then, that presentism must be understood. Their view is that, even if we quantify absoutely unrestrictedly, and so tenselessly, there do not exist any past or future things.

This completes my comments on how we are to understand the basic presentist thesis. In the next section I develop this account to make sense of how they have traditionally understood past and future tense sentences.

Section 2: Primitive Tense Operators, Presentism, and Past and Future Tense Sentences

In the above I have described the basic presentist view, according to which they believe that no past or future things exist simpliciter. But this now raises the question of how they understand past and future tensed sentences. Again, I focus on the past tense, but all of what I will say will apply to the future tense too. As mentioned, they do not want to deny the truth of past tense sentences, for example, those about the past existence of dinosaurs. So, although they deny that Larry the dinosaur exists simpliciter, they want to say that when we *do* use the past tense and say that Larry

the dinosaur *did* exist, this is true. That is, they want to say the following past-tense existence sentence is true:

Past tense dinosaur sentence: Larry the dinosaur did exist.

But, how are they to understand such existence sentences? After all, they seem to involve the quantifier “exists”, and as such, doesn’t this commit them to the existence of Larry after all? In fact, they claim, it does not. In order to see why it is useful at this point to once again consider how an eternalist might understand past-tense existence sentences such as the one above.

Eternalists can, in fact, understand past tense existence sentences such as the past tense dinosaur sentence in terms that we have already introduced. They can say that past tense existence sentences are, in fact, sentences that express restricted quantification over past things. They can thus give an interpretation of the past tense dinosaur sentence in the following way:

Domain: the past

Translation: $\exists x(\text{Larry} = x)$

It seems that this interpretation of the sentence is not available to presentists. Instead, it seems, they must give a different interpretation using a different device that we have not yet considered. And traditionally, presentists have done just this.

The device that has traditionally been used is one that was introduced by Arthur Prior, one of the first defenders of presentism in modern times. The device he introduced is known as a ‘primitive tense operator’. This is, to put it simply, a bit of

language that attaches to a tenseless sentence and turns it into a tensed one. For example, consider the tenseless dinosaur sentence from above once more:

Tenseless dinosaur-sentence: Larry the dinosaur exists simpliciter.

Now consider attaching to it the term “IT WAS THE CASE THAT” which functions to turn sentences into past-tense sentences:

Past tense operator dinosaur sentence: IT WAS THE CASE THAT: Larry the dinosaur exists simpliciter.

This, according to Prior, expresses the same content as was expressed by the past tense dinosaur sentence above, i.e. as:

Past tense dinosaur sentence: Larry the dinosaur did exist.

And so, the past tense dinosaur sentence is not understood as a sentence in which restricted quantification is used (i.e. as eternalists understand it), but rather as a sentence built up from a past tense operator and a sentence that used unrestricted quantification. And this account generalises to all past and future tense sentences.

There are two important points to note about Prior’s use of primitive tense operators. First, Prior says that they cannot be defined in any more basic way. That is why they are called “primitive” tense operators. Second, he says that whenever a sentence is within the scope of a past- or future- tense operator, then it is *not* existentially committing. That is, he claims that although present tense and tenseless

sentences containing quantifiers commit one to the existence of the things asserted to exist, sentences with past and future tense operators attached to them do not. And so, in this way, Prior thinks (and many presentists have since agreed) presentists are not committed to the existence of dinosaurs when they admit that existence sentences such as the past tense dinosaur sentence are true. In the next section I introduce an argument that I believe shows that this view cannot be maintained.

Section 3: The Truthmaker Objection

In this section I begin to clarify the line of argument against presentism that I began the chapter with. There I said that, it seems, past tense sentences such as the past-tense dinosaur sentence are *about* the things they mention - in this case, about a specific dinosaur called “Larry”. But, I said, presentists have to maintain that there is *nothing* such sentences are about. We can now understand this claim a bit more precisely. Presentists, it seems, must maintain that there does not exist simpliciter anything that such sentences are about. They may well say, as Prior does, that they are not committed to the existence simpliciter of past things in asserting past-tense existence sentences. But this does nothing to take away the worry that such sentences aren’t about anything, on their view. Indeed, it seems to be basically an admission of that fact there is nothing they are about. But how are we to make the worry itself more precise? At this point it is useful to introduce the notion of a “truthmaker”.

A truthmaker is an entity of some kind or other that serves as an ontological ground for truth. The basic idea is that if a sentence, i.e. some words on a page or

spoken out loud, are to possess the semantic property of being true, then there must be some explanation of *why* they possess that property (rather than the property of falsehood). Sentences by themselves, it seems, cannot be true in the absence of some relation between their parts (i.e. the words and phrases that make them up) and something else. This basic mataphysical idea can, and has been, captured in terms of the following principle called the 'Truthmaker Principle':

> Truthmaker Principle: For every true sentence, there must be a state of affairs existing in the world that necessitates and/or grounds its truth.

In order to clarify what this means, a good example is that if the sentence 'Tigers live in Asia' is true, then there must be some things that exist in reality that makes it true. In this case, as this is a present tense sentence, both presentists and eternalists can easily say what it is that exists in reality and makes it true. It is simply: Tigers - i.e. real, flesh and blood animals. The existence simpliciter of these creatures serve to ground the truth of this sentence in line with the Truthmaker Principle. But now, return to our past-tense dinosaur sentence once more:

> Past tense dinosaur sentence: Larry the dinosaur did exist.

This sentence, we are supposing, is true. But then the Truthmaker Principle requires that there is something that exists simpliciter to ground its truth. Eternalists can say what this is, in exactly the same way that they can say what makes the sentence about tigers true. They can say that it is existence simpliciter of Larry the dinosaur, who exists as a real, flesh and blood creature, in precisely the same way that tigers

exist as flesh and blood creatures. The only difference between Larry and tigers is that Larry exists in the past, and tigers exist in the present. The problem for presentists is that they do not believe that Larry exists simpliciter, and so clearly cannot appeal to his existence simpliciter to ground the truth of the sentence. As a consequence, it seems they must violate the Truthmaker Principle, which, as has been mentioned, is thought to be basic metaphysical priunciple. And so, as they violate a basic metaphysical principle their view must be rejected.

I think that the above objection is fatal to presentism. But we cannot rest content with merely stating it, because there have been responses to it made by presentists. There have been three broad kinds of reply. The first reply has been an attempt to modify the Truthmaker Principle to make it "presentist-friendly". The second has been to maintain that there are some things existing in the present that make past tense sentences true. And the third has been to modify presentism itself to make it amenable to the Truthmaker Principle. So, in the remainder of this chapter I consider these responses and reject them. My conclusion will thus be to endorse the objection wholeheartedly, and reject presentism on its basis.

Section 4: Presentist Reply 1 - Modifying the Truthmaker Principle

In making this reply the presentist agrees that the Truthmaker Principle is a basic metaphysical principle, but disagrees with how it is stated. Their idea is to reformulate the principle so that it can allow past tense sentences to be true even if there does not exist simpliciter anything to make it true. How can they do this? The basic move they make is to note that the Truthmaker Principle, as stated above, is

stated using the present-tense, and then argue that as stated it does not take account of the fact that past-tense and future-tense sentences may have different kinds of grounds from present-tense sentences. That is, they argue that although present-tense sentences need there to exist simpliciter things that make them true, past-tense and future-tense sentences do not. Instead, they argue, past-tense sentences need there to *have been* things that exist simpliciter to make them true, and future-tense sentences need there to *will be* things that exists simpliciter to make them true. There have been a number of attempts to reformulate the Truthmaker Principle along this line, but the basic idea is always the same. So, we can consider just one illustrative example here. I pick the first extant suggestion of this kind, made by Andre Gallois. He suggests:

> Presentist Truthmaker Principle: 'What is true supervenes on what objects exist [simpliciter], have existed [simpliciter], or will exist [simpliciter], and what properties are, have or will be possessed by things that exist [simpliciter], have existed [simpliciter] or will exist [simpliciter], and what relations hold between those things.' (Gallois, 2004: 649)

To illustrate, consider once again:

> Past tense dinosaur sentence: Larry the dinosaur did exist.

Using Gallois's suggestion, presentists can now say that although nothing does now exist simpliciter that makes this sentence true, it is nonetheless true because it *was* the case that Larry the dinosaur existed simpliciter.

I think this kind of response cannot succeed. The reason is that what we are looking for is an ontological base for the truth of sentences *now*. That is, we must remember that although the past tense dinosaur sentence is a past tense sentence, it is true right now in the present. It is not merely the case that it *was* true in the past. My argument here is that the presentist might well be able to appeal to the fact that it *was* the case that dinosaurs existed in the past to account for the truth of the fact the *present tense* sentence 'dinosaurs exist' *was* true. But, I do not think they can appeal to the fact that it *was* the case that dinosaurs existed in the past to account for the truth of the fact that the past tense sentence 'dinosaurs existed' is true *in the present*. Another way to put this is to say that past truths may have past Truthmakers, but present truths must have present Truthmakers. And, despite being a past tense sentence, the past tense dinosaur sentence is a *present* truth, not a past one.

In order to bolster my argument above it is worth noting that even if presentists accept Gallois's suggestion above, when they claim that a present tense truth is made true by what exists simpliciter in the present, they will make an appeal to an ontologically committing explanation. For example, consider what they would say about the following present-tense sentence that asserts a fact about one of the elephants in London zoo:

Nelly sentence: Nelly the elephant has a trunk.

Even if they accept Gallois's suggestion, presentists will say of this sentence that it is true in virtue of the existence simpliciter of Nelly. That is, they will say its truth is grounded by the following:

Nelly grounding: There exists simpliciter some elephant, Nelly.

And this, on their view, is an existentially committing sentence, and so they existentially commit themselves to there being a real ground of the truth of the Nelly sentence. By contrast, consider some past tense sentence that states a fact about Larry the dinosaur, e.g.:

Larry sentence: Larry the dinosaur had big feet.

Here they will say that this sentence is true in virtue of the fact that it was the case that Larry the dinosaur existed simpliciter. But this, on their view, is not existentially committing. In this case, the ground of the sentence will be:

Larry grounding: IT WAS THE CASE THAT there exists simpliciter a dinosaur, Larry.

And so, because the existence sentence is here embedded within the scope of a primitive tense operator, it is not existentially committing, and they do not commit themselves to there being a real ground of the truth of the Larry sentence.

The above point does nothing more than spell out the response in more detail. But it is a telling one. The reason is that presentists are happy to admit that present tense sentences need actually existing real grounds, but deny that past tense sentences do. But, this ignores the fact that present and past tense sentences are on a par with regards to their truth. They are both true *now*, i.e. *in the present*, and so if

we are to explain their present truth they should both be treated on a par, and so both should be provided with actually existing real grounds. As the presentist does not provide these by shifting to an alternative account of the Truthmaker principle, I conclude that this shift does not get them out of their difficulty, and so that this response fails.

Section 5: Presentist Reply 2 - Appealing to Presently Existing Surrogates

Another response that has been given to the Truthmaker argument by presentists is to admit that they must find actually existing real grounds for past tense sentences, but deny that those things must be the things we ordinarily think they must be. So, for example, they deny that in order to ground the truth of the past tense dinosaur sentence we must appeal to the existence simpliciter of Larry the dinosaur himself. Instead, they maintain, past tense sentences such as that one can be grounded by the existence of some surrogate entity that does, in fact, presently exist. As it has been put by Caplan and Sanson in their survey of the attempts that have been made in this direction, by taking this line presentists attempt to 'equip the present with a perfect record of the past'. (Caplan and Sanson, 2011: 200) I think that none of these attempts succeed. But, in order to get a better grasp of them, I first outline some of the attempts that have been made and offer initial reasons for rejecting them.

The first attempt I outline is that made by, for example, Craig (2003: 400). It is to say that for each true past tense sentence there exists in the present some unstructured primitive past tense fact that corresponds to it. So, for example, there

will exist simpliciter the primitive fact *that Larry the dinosaur existed*, and the primitive fact *that Larry the dinosaur had big feet*, and so on for all the true past tense sentences. Even if we allow the general idea that there can be presently existing records of the past that make past tense sentences true, this view is wholly implausible. It is implausible because, on this view, the primitive facts are *unstructured*, and so there must indeed be one for *each* true past tense sentence. This means that there will be no internal connection between the primitive facts. So, for example, there will be a primitive unstructured fact *that Larry had feet*, and a primitive unstructured fact *that Larry had big feet*, but these will be two independent facts, and not linked in any way, and this is what is so implausible. Surely, if there are facts about the past, even if there existence is in some way primitive, there must be some story to tell about how they relate to the things that once existed, and to one another. Craig Bourne, himself a presentist (we will consider his view in the next section), in discussing the Truthmaker argument against presentism, puts the point here as follows:

> What are the constituents of the facts that make them true?... how is it possible for the proposition that Socrates taught Plato to be true? Which particulars can be invoked as the constituents of such a fact? Not Socrates or Plato – they don't exist. Nor can we invoke a present past-Socrates – what a mysterious object that would be! The alternative is to invoke the primitive present fact that Socrates taught Plato. *But without being able to say how this fact is structured (for its constituents are certainly not Socrates or Plato), this move is far from satisfactory.* (Bourne 2006b: 3-4) [emphasis added]

Recognising this problem, others have attempted to say more about the structure of the presently existing facts that presentists suppose exist. The most fully developed is probably than given by Simon Keller (2004). Keller first argues that presentists can admit the existence of what are called 'haecceities'. These are properties that are possessed essentially by all individuals, and are the properties that things have in virtue of being the individual things that they are. So, for example, Theresa May as the property of *being Theresa May*, London Bridge has the property of *being London Bridge*, my teapot has the property of *being that particular teapot*, and so on. Keller then argues that presentists can admit that properties can exist even if they are not instantiated. So, for example, even if we destroyed all the blue things in the world, on this view the property of *being blue* would still exist. This then allows the presentist to say that although past objects do not exist simpliciter (i.e. they do not presently exist), their haecceities do. So, for example, although Larry the dinosaur does not exist simpliciter, Larry's haecceity, the property of *being Larry the dinosaur*, does. And now it becomes clear how they can respond to the Truthmaker problem. Once more, consider:

Past tense dinosaur sentence: Larry the dinosaur did exist.

This sentence, Keller's presentist can say, is made true not by the existence simpliciter of Larry himself, but by the existence simpliciter of his haecceity, which exists in the present and is just as real as the tigers in Asia are.

There are some additional problems that Keller's presentist must deal with. Consider the following sentence again:

Larry sentence: Larry the dinosaur had big feet.

Here Keller's presentist must say more than just that Larry's haeccity exists simpliciter and grounds the truth of this sentence. They must also explain how Larry's haecceity somehow makes it true, specifically, that Larry *had big feet*. This is a difficulty, because unlike Larry himself, who is (or was) an object capable of possessing feet, Larry's haeccity is not an object but a property, and so not capable of having feet at all. But there do appear to be solutions to this. The solution that Keller suggests applied to this example would be somethig like this: Larry, when he existed, had the property of being Larry, and his feet, when they existed, had the property of being those very feet. These properties were related to each other in virtue of both being properties of Larry, and the property of being Larry's feet, in addition, had the second order property of being the property of big feet. So, when Larry and his feet went out of existence, the property of being Larry and the property of being his feet stayed in existence, and continued to bear some kind of relation to each other and the same second-order properties. In fact, they still do exist in the present and bear that relation to each other, and have the same second order properties, and so the Larry sentence is grounded in the fact that these properties exist in the present, bear those relations to each other, and have those properties. As Keller himself says:

> Among the haecceities that presently exist, the presentist can say, are the [haecceity] of Anne Boleyn, of the sword with which Anne was executed, and of the swordsman who was specially brought over from France. These properties themselves, says the presentist, instantiate a relation that

> somehow mirrors the relation that the four-dimensionalist claims to be instantiated by Anne, the sword, and the swordsman. (Keller 2004: 97)

To be more specific about this statement by Keller, the four-dimensionalist believes that the relation is to be held between individuals, and cannot exist without the existence of the individuals involved, whereas the presentist is convinced that the relation exists between properties, in other words, the existence of the individual who possesses the properties does not necessitate the relation, it can still exist as long as there are the related properties. Whether or not the above further suggestion is at all plausible will not be my concern, for I think there is an insurmountable objection to the whole enterprise of providing presently existing surrogates of past things that applies to any possible suggestion that might be made (i.e. Keller's, and any other that might be made). The objection is that any such surrogates, whatever they are, could exist even if the past tense sentences were in fact false, and so cannot act as grounds for the truth of past sentences. I spell this out in more detail in the next paragraph.

I focus on Keller's suggestion, but my point is general. To make it I use God as a illustrative device (i.e. you do not have to think that God in fact exists for my point to hold, but it is a useful way of making the point). Suppose that, in fact, Larry the dinosaur had never existed, and so the past tense dinosaur sentence is in fact false. But now suppose that God decided to create Larry's haecceity (i.e. without actually creating Larry). If God did this, then Larry's haecceity would exist now in the present, in an uninstantiated state, and so would exist simpliciter. But then, because it is the existence of this haecceity that makes the past tense dinosaur sentence true,

according to Keller's presentism, the presentist would be committed to the truth of the past tense dinosaur sentence, even though it is in fact false. What this simple line of thought establishes is that , if Keller's presentist were right, Larry's heacceity would ground the truth of the past tense dinosaur sentence even if that sentence were false. But, this is absurd. Nothing that would ground the truth of a true sentence even if it were false can ground its truth if it is in fact true, for there is no genuine connection between the actual truth of the sentence and the existence of its grounds. Although this has been put in terms of Keller's presentist, it could be made in terms of any suggested presently existing surrogate. And so, I think, no response of this kind can possibly succeeed.

I think the objeciton I have given here points to a general difficulty. To go back to my original way of stating the problem at the beginning of this chapter, the past tense dinosaur sentence is *about* Larry himself, not about any surrogate. So, it seems to me, only Larry himself can ground the truth of the sentence. If presentists attempt to ground the truth in terms of some surrogate, they turn the sentence into one that is about the surrogate itself, and not about the thing it is supposed to be about. But then, this breaks the connection between the truth of what the sentence is about and the existence of the surrogate. The reason the sentence can still be true even if Larry never existed is that the sentence, on the understanding of the presentist who insists on a surrogate, is not about Larry at all, but about his surrogate. And so, although presentists might ground the truth of some sentence (i.e. one about its surrogate) they change the topic, and so fail to ground the truth of the original sentence *at all*. And so, I conclude, this response to the Truthmaker objection also fails.

Section 6: Presentist Reply 3 - Reformulating Presentism

The final response that has been made has been to reformulate presentism. Above I mentioned Craig Bourne, and he is the main proponent of reformulating presentism to overcome the Truthmaker objection, and it his view that I consider in this section.

Bourne's basic idea is to reject Prior's primitive presentist formulation. Remember that according to that formulation, past tense sentences are to be understood in terms of primitive past tense operators so that past sentences are not existentially committing. Bourne rejects this idea and claims that past tense sentences are in fact existentially committing for the presentist, but that they are not therefore committed to the existence of *concrete* past times. To explain further, note that eternalists not only think that the past, present and future all exist, but they think that the past, present and future are all on a par in being concrete entities. To see what this means, consider that the present contains physical objects - people, rocks, buildings, and so on. The eternalists thinks the past and future are exactly the same in that they too contain objects that are physical in just the same way. This is what it means to say the past, present and future all contain concrete things. Bourne's suggestion, therefore, is to say that one can still be presentist even if one denies the definition we have given of it, i.e.:

> Presentism: Only present things exist simpliciter.

Bourne argues that the presentist can still be a presentist if he admits that past things *do* exist simpliciter, but denies that those things are *concrete*. Instead, he

suggests the presentist should say that present things are concrete, but that past and the future things are *abstract* things. Although he does not explicitly spell this out, he thus redefines presentism as follows (he calls the view 'ersatzer presentism'):

> Ersatzer Presentism: Only presently existing things are concrete, whilst past and future things are abstract.

If Bourne is right that this is an acceptable version of presentism, it certainly overcomes the Truthmaker objection, because the ersatzer presentist now has things that exist simpliciter in the past to make past tense sentences true. For example, once more (and for the last time now) take the two sentences that have been concerning us:

Past tense dinosaur sentence: Larry the dinosaur did exist.
Larry sentence: Larry the dinosaur had big feet.

On Bourne's version of presentism, both of these sentences are made true quite simply by the existence simpliciter of Larry. Larry really does exist in the past, on Bourne's version of presentism, and he has big feet. It is just that he and his big feet exist as abstract entities rather than concrete ones. In other words, present tense sentences are about a concrete realm of existing objects, and so are grounded by the existence of concrete things, and past tense sentences are about an abstract realm of existing things, and so are grounded by the existence of abstract things.

Bourne goes to great lengths to develop this basic position in detail. He goes on, for example, to define past and future states of the world in terms of maximally

consistent sets of propositions, which he calls ‘u-propositons’, and proposes that they are ordered along a real dimension R, and linked to a description of the present state of the world (also given in terms of u-propositions), via a special relation that he calls the E-relation. In these terms he thinks he can give an account of what it is for a past sentence to be true:

> ‘It was the case that p’ is true simpliciter iff p is a member of a set U of u-propositions that is the first element of an ordered pair <U, ni∈R> actually E-related to the currently instantiated ordered pair <v, nj∈R>, where v is the set of u-propositions that is true simpliciter, and ni<nj. (Bourne, 2006b: 13)

Now, what all of this means precisely will not in fact concern us. The reason is that I do not think we need to engage with the details of Bourne’s account in order to refute it. That is, I think the whole approach can be shown to be misguided without considering those details.

The basic objection that shows Bourne’s view to fail is, in fact, an extension of my objection given in the previous section. Bourne thinks that the past is an abstract realm that presently exists. But, in turning the past into such an abstract realm he changes the subject just as much as those who seek currently existing surrogates for past objects. The past tense dinosaur sentence is about a concrete thing, Larry, and not some abstract thing such as a constutuent of a proposition. Once more, even if Larry did not exist, there is nothing to stop God creating an abstract realm in which an abstract Larry does exist, and setting up the abstract realm so that it is linked up with a description of the present concrete world via an E-relation. And if God did do this, it would make the past tense dinosaur sentence true, even though Larry never

existed. And so, Bourne's view fails for the same reason that the view of those who seek surrogates for past things fails.

Bourne does have a possible reply here. Bourne might say that if God did do this then it would not be true that Larry never existed, because Larry's abstract present existence is precisely what makes it the case that Larry once existed. But this is wholly unsatisfactory. For suppose what would happen if God were to remove the currently existing abstract Larry from existence, or remove the E-relation link between abstract Larry and the present time. What would then happen? The past tense dinosaur sentence would go from being true to being false. But that a true sentence about the past could become false is absurd, or at the very least, goes against everything we believe about the past and so is so revisionary as to make the position untenable. And yet this is a possibility that ersatzer presentists are committed to.

It is no good Bourne replying that this is not a possibility, for the simple reason that the fact the abstract past is linked via E-relations to the actual present is a *contingent* fact. There are a huge many possible abstract pasts, of which only one is the actual abstract past, on his view. But the only thing that grounds this fact is the existence of a contingent E-relation linking one of those abstract past to the present. And the holding of this relation is a mere contingent truth. Of course, what Bourne might want to say in response to this is that the E-relation that does in fact hold, holds because it correctly mirrors the *actual* past (i.e. that the E-relations that pick out the abstract past hold because the abstract past so picked out matches with the actual past of the world). But no erstatzer presentist can say this, for what the actual past *is* is supposed to be *constituted* by the holding of the E-relation, and so the

actual past cannot act as an independent constraint on what E-relation holds. I thus conclude that Bourne's response to the Truthmaker objection also fails.

Conclusion

I have argued in this chapter that presentism cannot account for the truth of past tense sentences, i.e. that it falls prey to the Truthmaker objection. I have considered all the extant responses to this objection, and rejected them all. So, I conclude, presentism itself must be rejected. This will now serve as a fixed point in what follows. If we are to account for the metaphysical nature of time, we must look to another position.

Chapter 2

Against the B-theory [Part 1]

Introduction

In the last chapter I argued that presentism faces irresolvable problems from the truthmaker objection, and so should be rejected. Presentism is an A-Theory view. In this chapter and the next I will consider the alternative view to the A-Theory, viz. the B-Theory, according to which there is no privileged present. The B-Theory entails eternalism, i.e. the view that all times are equally as real, and eschews the idea that there is any truth in the metaphor of time's flow. (However it should be noted that eternalism does not entail the B-theory, for there is an eternalist version of the A-theory, namely, the Moving Spotlight View, which I will consider in chapter 4.) Nonetheless, B-theorists think that they can account for the *apparent* flow of time, i.e. they argue that although there is no truth in the idea that time flows, they think they can explain why it *seems* to us that it does. Despite what many B-theorists maintain, however, in this chapter I will argue that the B-Theory's account of the apparent flow of time is highly problematic. I will argue that we have good reason to think that the flow of time is a genuine feature of the world and that any account of time must take this into account. But, whilst I will argue that the A-theorist can account for this, the B-theorists cannot. In other words, I will argue that the A-Theory is *more plausible* in respect to the issue of the flow of time, and so the B-Theory must be considered a second best option when attempting to deal with this issue. That is, I will not argue directly for the falsity of the B-theory in this chapter, but merely present a problem for it, that shows the A-theory is stronger with regards to

the issue of the flow of time. In chapter 3 I will then consider how the A-theory and B-theory can account for the persistence over time of physical objects. I will argue there that, once more, the A-theory has the upper hand, and that as a consequence we are justified in rejecting the B-theory. So, to emphasise, my argument in this chapter and the next is that the A-theory is in a better position with regard to two fundamental aspects of temporality, and that this is the reason the B-theory should be rejected.

At the end of chapter 3, therefore, the following position will have been reached. I will have rejected one version of the A-Theory (i.e. presentism) and the B-Theory as a whole. This will leave two versions of the A-Theory left standing, viz. the growing-block view and the moving spotlight view. In chapter 4 I will consider the moving spotlight view, and reject that too. This will lead me to consider the growing block view in chapter 5, which I will endorse.

In more detail, then, my argument in this chapter proceeds as follows. In section 1 I outline the distinction between the A-theory and the B-theory in more detail, drawing upon McTaggart's seminal dicussion of how moments in time can be arranged according to an A-series and a B-series. This will be related to the issue of the flow of time. I will argue that if the flow of time is to be thought a genuine feature of reality, then the B-theorist must account for it. In section 2 I consider an objection to the effect that the adding A-properties cannot make a difference to whether it appears to us that time flows, and reject it. In sections 3-6 I then argue that in order to account for the flow of time, the asymmetry of the B-relations must be demonstrated, and show how the A-theorist can do this whilst the B-theorist cannot. Finally, in sections 7-8 I discuss the B-theoretic rejoinder to this view, according to which we can reject the idea that time itself flows, and explain the apparent flow of

time in terms of it being mind-dependent. I argue that this position is implausible, and so conclude that the A-theory is able to account better for the flow of time than the B-theory.

Section 1: The A-series, B-series, A-theory and B-theory

Instead of diving straight into my objections against the B-Theory of time, I think it is necessary to briefly go through the notions of the A-Theory, B-Theory and the flow of time first, with which clearly explained, there will be a more explicit picture about what is coming up in my argument against the B-Theorist.

In order to disprove the existence of time, McTaggart offers notions that form the basis of the definitions of the A-theory and the B-theory in his 1908 paper 'The Unreality of Time'. He starts with distinguishing two ways in which temporal positions can possibly be ordered, namely, the A-series and B-series. When the temporal positions possess the properties such as *being three days future*, *being present*, and *being two days past*, etc., these temporal positions are ordered by what McTaggart calls 'the A-series', and these properties are what McTaggart calls 'A-properties'. As for the B-Theory, when there are the relations between the temporal positions, such as *being three hours earlier than*, *being simultaneous with*, and *being one day later than*, etc, and the series which is arranged by these relations is what McTaggart calls 'the B-series', and these relations are what McTaggart calls 'B relations'.

McTaggart maintains the claim that the A-series is essential to the existence of time, but denies the reality of time by saying that the A-series is inherently contradictory, and that without the A-series, the B-series is not capable of

constituting time for it does not involve any genuine change. Although the pursuit of this chapter is not to discuss McTaggart's rejection of the existence of time (but his claim that the A-series is inherently contradictory is part of the discussion in this chapter), his view on the A-series and B-series has certainly created a significant sphere in the study of the nature of time, and attracted various perspectives on the matter, such as the A-theorist view and its opposite, the B-theorist view.

As mentioned above, McTaggart argues that arranging moments of time according to the B-series cannot constitute time, due to its lack of change. However, B-theorist proponents, such as D.H. Mellor and J.J. Smart, disagree with this consideration and claim that the B-series suffices for the existence of time. They maintain this because, they claim, there is no genuine change in time, and therefore our perception of the flow of time is nothing but an illusion caused by human consciousness. In other words, the B-theorist believes that '*the flow of time is not objectively real.*' (Baron, 2017: 610) Contrary to this, the advocates of the A-Theory claim that there are genuine and irreducible A-properties such as *being two days future*, *being present*, and *being three days past*, which temporal positions gain and lose, and importantly, it is because of these properties and the temporal change involved, that the flow of time is a natural and genuine feature of the world.

So far in this thesis, things do not look optimistic for the A-theorist, because, as concluded in the previous chapter, the only version of the A-theory considered, i.e. presentism, cannot account for the flow of time (simply because it is false). And admittedly, the B-Theory eternalist view does have intrinsic advantages in certain respects over presentism. For example, it can explain the causal relations between two temporal events, since all times are real and so the existence of the relata of causal relations is guaranteed. More importantly, its consistency with the Truthmaker

principle makes it look more reasonable than presentism. Despite these advantages, however, there is one question that we can ask B-theorists that is just as troubling for them as the Truthmaker objection is to presentists. This is: how the flow of time can be explained given there is no temporal change that can actually make a physical difference to the world, according to the B-Theory. If the B-theorist cannot provide a satisfying response to the challenge of temporal passage and change, then the A-theorist will have a stronger case on this matter. We may have to reject presentism, but there are other A-Theory views that may be able to legitimately explain temporal flow without falling foul of the Truthmaker objection. So, the question we now face is: can the B-theoriest account for the flow of time?

Section 2: Do A-properties make a difference?

In response to the question of how to explain the flow of time, B-theorists must claim that there is no such a thing as genuine temporal passage, and therefore our experience of temporal passage should not be considered as an aspect of nature. As Price (2011: 276) puts it: there are two different directions that the enquiries with regard to time lead into, one considers human beings' perception of time as reflecting a natural feature of the universe, while the other regards it simply as a human psychological experience rather than an objective character of the universe. To demonstrate this point against temporal passage, the B-theorist offers the argument as below:

> Suppose that time actually flows, in the actual world, there is a sequence of physical states, p_1 ... p_n, where each physical state corresponds to the total

> way that the physical world is at a time. There is some world, call it **W**, in which a physical duplicate of each of the p_n exists, p^*_1 ... p^*_n but in which there is no such thing as the flow of time. Assuming that the mental supervenes on the physical, the duplication of the p_n is sufficient to duplicate our experiential lives. It follows that the flow of time cannot be making a difference to experience: the actual world in which time flows is experientially indistinguishable from **W** even though time flows actually but not in **W**. (Baron: 2017:612)

I have rejected presentism because it cannot overcome the Truthmaker objection. But I did allow that presentism could, if true, account for the flow of time. However, Baron's objection here suggests that presentism doesn't even have this advantage. To see this point made by Baron, leave aside for now the fact that presentism cannot provide an answer to the Truthmaker objection, and turn to the above argument in terms of the supposed fact that presentism can account for the flow of time. First, suppose that presentism is true and so that the world is a three-dimensional one in which events come into and go out of existence, putatively creating temporal flow. Next, imagine a four-dimensional B-theory world, where there is no temporal flow, and assume we map events-at-times in our three-dimensional presentist world to events-at-temporal locations in the four-dimensional world. According to Baron's objeciton, our perceptions from the three-dimensional presentism world will also get mapped to the four-dimensional world. In this case, the B-theorist argues that *surely* our perceptions in the four-dimensional block universe are the same as our perceptions in the three-dimensional world, and for this reason our perceptions in the

presentism three-dimensional world do not play any role in explaining why it seems to us that time flows.

However, advocates of the A-Theory have rejected this argument. According to Maudlin (2007: 122), it is not true that duplicates in the four-dimensional world possess the same perceptions as they do in a presentist world. The response, in effect, is to deny that there is any legitimate reason to grant such a mapping result. The A-theorist can simply argue that there are no reasons to allow that there is a such a mapping result because in a four-dimensional world, where there is no temporal flow, the natural states will be *different* from those in a presentist world. As such, one cannot presume that a world with lack of the flow of time would produce the same experiences in consious subjects as a world that possesses genuine flow. Thus, by claiming that the three-dimensional and four-dimensional worlds are the same in this respect the B-theorist begs the question.

Of course, the above objection was put in terms of presentism, which has already been rejected. But the basis point applies even if some other A-theory view is true. The lesson here is that B-theorist cannot *assume* that if the universe is consisted of an A-theoretical reality, this does not make a difference to our experiences. Instead, they must show that this is so. They must do this by showing that, if the universe has only a B-theoretical reality, then our experiences of the flow of time can still be accounted for. I will turn to this attempt in section 8 below. However, what the above objection does also do is to point out that if the A-theory is to be plausible, they must in fact be able themselves to account for the flow of time. It is to this task that I turn in the upcoming sections. I frame the issue in terms of an objection that can be made against the B-theory.

Section 3: The Spatializing Time Objection

The A-theorist cannot merely rest content with refuting argument from B-theorists like that given above. They must offer their own positive arguments against B-theorists. One such argument is to accuse B-theorists of being '*guilty of "spatializing" time...and the theory, as so gross a distortion of reality with respect to time, therefore cannot be correct.*' (Craig, 2000: 149) To be more specific, the A-theorists can argue that conceiving of time as being laid out on a spatial line, with the B-relations such as '*later than*', '*earlier than*' and '*simultaneous with*' holding between temporal positions spatially along this line, is perfectly OK, so long as this picture is viewed as being purely metaphorical. But, they can argue, the B-theorist views these relations as literally holding between points along a dimension that is rightly conceived of spatially, i.e. as a line. This, A theorists can maintain, is a gross error. It conflicts with our intuitions about time in such a fundamental manner that it simply cannot be the right view, and indeed, on this view we cannot even legitimately think of the B-relations as being genuine *temporal* relations at all. Time is supposed to be something that flows in a manner that a line cannot do, and so relations amongst points on a line cannot themselves be thought of as being temporal relations unless something more is said. And so, one cannot treat this picture literally and consider it as being a sufficient condition for the existence of time. To do so, the A-theorist can say, is to 'spatialize time'.

In order to avoid any confusion, the A-theorist's accusation here is not to be understood to suggest *merely* that the B-theorist treats time just as another spatial dimension. What the A-theorist means here by 'spatialization' is that:

> [I]n the absence of objective [A-properties], the temporal dimension has been robbed of that which makes it time, so that the ordering relations which obtain among putatively temporal particulars are only gratuitously labelled “earlier than/later than” and the resultant dimension if not a mere spatial dimension, is in any case definitely not time. (Craig, 2000:150)

Another way of putting the point here is to point out that the B-theorist thinks they can explain the existence of time and the fact that there are temporal relations between temporal positions such as *earlier than* and *later than*, while denying the existence of an essential feature of time and temporal relations, namely, *tense*. For notice that the notions of *earlier than* and *later than* are tenseless notions. If one moment is ten years earlier than another, it is always true that it ten years earlier than it. But now note that if one moment is, say, earlier than another, then the facts that occur at the first can be described as *having happened* from the point of the view of the second, and the facts that occur at the second as such that they *will happen* from the point of view of the first. But given that neither of the two moments are in a priviliged position with regard to each other (they are simply two points on a line, which itself has no intrinsic direction), why is there such an asymmetry here? Why can’t the events at the second moment, for example, be described as *having happened* from the point of view of the first? Simply laying events out on a line gives us no asymmetry. Only the movement of time from future to past does. For these reasons, it is rational to seek out for the answers to the questions such as why these relations which do not possess any tense should be considered ‘earlier than’ or ‘later

than'; and why the B-theorist even regards these so labelled relations as temporal if they are tenseless.

I endorse the above line of argument against the B-theory. However, it is crucial to note that although this line of argument tells agains the B-theory, it is not therefore automatically an argument in favour of the A-theory. This is because it still needs to be shown that the A-theoriest can themselves offer an adequate account of the asymmetry of the B-relations and so of the direction of time. It does, at first, seem that A-theorists can do this quite easily, in the following way: They can maintain that it is the objective flow of time that gives us an asymmetry. If one moment is earlier than another, this is because the first event was present whilst the second was future, and became past before the first became present. It thus seems they can explain why the events that occured at the first moment *have happened* from the perspective of the second and not vice versa. As Craig puts it:

> [T]he obtaining of the temporal relations earlier than/later than among temporal particulars can be derived from the objectivity of [A-properties] and the A-series. (Craig, 2000:150)

This is to agree with what McTaggart (1968: 30) claims, that both the A-series and the B-series should be considered crucial to the existence of time, yet the B-series is to some extent dependent on the A-series. Indeed, McTaggart himself also says, the relation *earlier than* can be said to be definable in terms of the A-series:

> 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, 1968: 271)

However, we cannot rest content with this line of argument, because there are serious problems with these kinds of definition. Put briefly, the trouble is that they rely upon our already having an account of *tense*. Consider, for example, what was said above once more, paying close attention to the italicised words: If one moment is earlier than another, this is because the first event *was* present whilst the second *was* future, and became past *before* the first became present. The italicised words express *tenses*. And so, it seems, the A-theory must assume that we can make sense of tense independently of the A-properties themselves. A similar problem is faced by McTaggart's definition, which only makes sense if we read the 'is' contained within it as expressing the present tense.

I consider whether this difficulty can be overcome in the next three sections, and argue that it can. My starting point will be with the surprising fact that the B-theorist D.H. Mellor himself seems not to recognise this difficulty for the A-theory. He says:

> The A series could easily distinguish earlier and later. To be earlier is to be more past or less future, to be later is to be more future or less past. Specifically, e is earlier than e* if e is sometime present when e* is future and sometime past when e* is present, whereas e* is never present when e is future or past when e is present. Earlier and later are clearly definable by the order in which things, events and dates cease to be future and become first present and then past; and the difference between them is that everything moves from future to past, not vice versa. (Mellor, 1981: 140)

Note, however, that Mellor here uses three different way of defining the B-relations in terms of A-properties. He seems to present these definitions as equivalent, but it is not clear that they are. But, at any rate, perhaps his thought is that at least one of these definitions overcomes the problem of assuming that we can make sense of tense independently of the A-properties themselves. Now, in fact, by drawing upon work by Craig (2000) I will argue that this in fact true. But, Mellor himself says no more than the above, and objections to his definitions can be found in the work of Gale (1966) and Oaklander (1987, 1996). So, as Craig himself notes, whether or not Mellor thinks his definitions do in fact overcome the problem, this fact cannot be merely assumed, but must be shown. And so we must say more than Mellor himself does. It is this that I turn to in the next three sections.

Section 4: Defining the asymmetry of B-relations in terms of A-properties: Mellor's first definition

Before I begin considering Mellor's three definitions, and the objections that have been raised against them, I wish to clarify one thing. Above I said that the three definitions may be considered equivalent by Mellor, but didn't answer whether they are or not. I do not, in fact, intend to discuss this at all. My strategy is to consider each of the definitions *as if* they are different from one another. However, different objections have been raised to each, and I will treat any successful objection to one of them as showing *all* of the definitions fail. That is, I will assume that if a successful objection can be made to one of the definitions, then the objection will carry across to all. This strategy is legitimate here because I will show that each of the objections in fact fails. So, in effect, I set a high bar for my defence of the view that we can

define B-relations in terms of A-properties. If it turns out that the objection to one of the definitions does not in fact carry across to the others, this is all well and good for my defence. But we do no harm by assuming each objection does carry across, if, as I do, we reject each of them.

With that explanation in place, then, I turn to Mellor's first definition. Craig, in discussing this issue, calls this definition "D_1":

> D1
>
> *to be earlier than* = $_{df.}$ *To be more past or less future than*
>
> *to be later than* = $_{df.}$ *To be more future or less past than*
>
> (Craig, 2000:151)

This characterization, according to Craig (2000: 152), entails that there is a restriction on the A-properties in this context, i.e. that they can only be attributed to *relata in a tensed way*. That is to say, to say that one event is more past or less future than another is equivalent to saying that, *if* one can get reference to the absolute present, *then* one can can say that the first is earlier than the second. That is, we must already presume that there is a privileged present if this definition is to work, which is to say we must already presume we can make sense of present tense utterences independently of our understanding of the A-properties. As such, according to this definition, if one cannot find a proper tenseless truth-bearers for the proposition, then the tenseless proposition '*one event e is earlier than the other event e**' does not really express the same meaning as the proposition '*one event e is more past or less future than the other event e**' in a present-tensed sense.

However, what Craig goes on to argue is that the way one analyses D_1 should not be as offering a definition of the *earlier than* or *later than* relations, in the sense of providing the *meaning* of the terms, but rather, one should read D_1 as offering a reductive analysis of the *earlier than or later than* relations in terms of A-properties. Furthermore, according to Craig (2000: 152), that the A-relations *more past/future than* and *less past/future than* can be truly and presently ascribed is a sufficient condition for the relations *earlier than/later than* to be truly and tenselessly ascribed. In other words, the proposition '*e is more past/less future than e**' being presently true is a sufficient condition for the proposition '*e is earlier than e**' to be tenseless true. As stated by Craig (2000: 152), these two definitions do not provide any evidence for one to figure out what the tense of e or e* is, as there are various combinations of different tenses that each event could possess. For example, event e could be present while the event e* is past. For this reason, Craig offers a modified version of D1, which is named D_1', and goes as below:

D1'

*e is earlier than e** = *e is more past or less future than e**

*e is later than e** = *e is more future or less past then e** (Craig, 2000: 153)

Regarding D_1', Craig (2000:153) argues that considering there are disjunctions contained in the right part of the equivalences, it is not possible for the A-properties to be considered as something that is ontologically derived from earlier than/later than relations, given there are no necessary associations between these equivalences and A-properties. Yet, temporal relations exist if and only if the tenses

are genuine. As such, he argues, the only explanation the B-relations are reducible to A-properties..

However, there is a further objection at this point, due to Gale (1968). With regard to this explanation of the equivalences, Gale claims that such an explanation trivializes the view that B-relations are reducible to A-properties. To be more specific as to his argument against this, Gale first introduces the notions of 'a pure A-series' and 'an impure A-series' and distinguishes one from the other: the former is 'a series which is determined only by unqualified [A-properties]' (Gale, 1968: 93); while the latter is 'a series which is also determined by the qualified [A-properties] *more past* and *more future*.' (Gale, 1968: 93) With these notions proposed and differentiated, Gale then goes on to claim that rather than demonstrating properly that the B-relations can be reduced to 'a pure A-series', D_1' only indicates that the B-relations are reducible to 'an impure A-series', therefore it makes the reduction from the B-relations to the A-series trivial.

What seems odd about Gale's accusation is the distinction between 'a pure A-series' and 'an impure A-series' that Gale draws in order to claim that it trivializes the reduction from B-relations to A-properties. According to Gale (1968: 93), a pure A-series has three different components, namely, the unqualified *past*, *present*, and the *future*. However, according to the A-theorist, the A-series is formed of countless tensed positions, such as 'ten years from now', 'three minutes from now', 'a second ago', and 'two days ago', etc. It seems that what Gale calls 'an impure A-series' just *is* the A-series, and so the reason for calling it 'impure' is not clear and therefore unnecessary. As a consequence, the notion of 'a pure A-series' appears to be as suspicious as the impure.

If the distinction between the two versions of A-series is not proved legitimate, then it is necessary to offer some justification for the claim that this analysis trivializes the reducibility from the B-relations to the A-properties. In response to this enquiry, Gale (1968: 99) claims that the true A-properties are only *past*, *present*, and *future*; and that the A-properties such as 'more past than' and 'more future than' seem to be reducible properties. However, such reply does not make Gale's complaint less vague, as there are several questions that arise immediately. For example, one can ask, even if others notions are reducible, why should one regard the A-properties other than 'past, present and future' as illegitimate'? One can also ask what expressions should be used to *locate* any events in the A-series and to show tensed facts, if nothing other than past, present and future is legitimate? The issue with Gale's understanding of the equivalences is that he thinks that the A-properties such as 'more future than' and 'more past than' might be an alternative but covert way of talking direct about 'earlier than' and 'later than', which are B-relations. But, as Craig makes clear, '*more future than* is an A-relation which is ascribed absolutely: e is not more future than e* at some time t; rather e is more future than e *, period.' (Craig, 2000: 154) Therefore, Gale's concern can be rejected, and unless there is any other objection to Mellor's definition (modified as Craig suggests) then we can endorse it.

Section 5: Defining the asymmetry of B-relations in terms of A-properties: Mellor's second definition

As I have said, I am supposing that an objection to one of Mellor's other definitions would count as an objection to all, so I now turn to his second definition and consider the objections that have been made to it.

The second definition Mellor offers is different from D1' in terms of the fact that rather than ascribing A-properties absolutely, this version attributes A-properies, relative to a specific time. And this version, which Craig calls "D_2" is as follows

> D2
>
> *e is earlier than e* = $_{df.}$ when e is present e* is future, and when e* is present e is past; and when e is present e* is not past and when e is future e* is not present*
>
> *e is later than e* = df. When e* is present e is future, and when e is present e* is past; and when e* is present e is not past and when e* is future e is not present*
>
> (Craig, 2000: 151 - 152)

The first thing to be noticed, according to this second definition, is that the definiendum and the definiens are both tenseless in terms of their truth value, with which some philosophers disagree. Gale, for example, states that if the definiendum and the definiens make tenselessly true or false propositions, then this definition should be rejected, for it is circular.

In reply to this objection, Craig (2000: 155 - 156) argues that despite the fact that Gale is right that the definiendum and the definiens make propositions tenselessly true and false, it does not necessarily result in that the A-properties

cannot be demonstrated in the definiens. Moreover, he claims that he is able to show this point by slightly changing the second definition:

> [T]he proposition ‘e is earlier than e*’ is defined in the way that ‘there is some time t such that at t ‘e is present’ and ‘e* is future’ are true’; likewise, the proposition ‘e is later than e*’ equals to the definition ‘there is some time t such that at t the propositions e is present and e* is past are true’. (Craig, 2000: 155 - 156)

If the propositions are defined this way, the definiens then certainly represents an irreducible A-property. What Craig intends to say here is that there is a fundamental misunderstanding in Gale’s grasp of this definition. That is that Gale mistakenly presumes that a tenselessly true proposition cannot involve an A-property. Craig’s point is simply that it can. Therefore, this second definition also faces no objection, and so we still have no reason to deny that B-relations (and so their asymmetry) cannot be defined in terms of A-properties.

Section 6: Defining the asymmetry of B-relations in terms of A-properties: Mellor’s third definition

The third and last definition (D_3) offered by Mellor contains tenseless propositions as to the existence of objective temporal becoming, it goes like this:

> <u>D3</u>
>
> *e is earlier than e* = df. e ceases to be future and becomes present first, and e* ceases to be future and becomes present second; and e ceases to be*

present and becomes past first, and e ceases to be present and becomes past second*

e is later than e = df. e* ceases to be future and becomes present first, and e ceases to be future and becomes present second; and e* ceases to be present and becomes past first, and e ceases to be present becomes past second*

(Craig, 2000: 152)

As stated, this definition suggests that there are tenseless propositions which indicate objective temporal becoming and that are involved in the definition. In other worlds, if these propositions are true, then the fact that objective temporal becoming exists itself gives rise to the existence of asymmetrical but tenseless B-relations. However, Craig thinks that there should be a simplified version of this definition that is supposed to make it clearer, so he reformulates D_3 as D_3' as follows:

D3'

e is earlier than e = e becomes present first and e* becomes present second*

e is later than e = e* becomes present first and e becomes present second*

(Craig, 2000: 157)

By offering this simplified version of D3, Mellor seems to be on the right track to explaining the B-relations through the tensed facts of the A-Theory. However, Oaklander (1996: 211) argues that the right hand side of the definition must appeal to B-relations itself, meaning that the B-relations are not themselves fully defined in terms of A-properties themselves, but rely upon a prior understanding of the B-

relations. More specifically, he argues that there is a hidden appeal to temporal B-relation between *e* and *e** and the 'first' and 'second' in the definitions appear to cover such a relation up. He says this because he thinks that saying that one thing comes "first" and another "second" must be interpreted as meaning that the former comes *before* the latter. And thus, Oaklander claims, B-relations (understood asymmetrically) have been smuggled into this definition.

However, there is a simple reply to this, that Craig (2000: 157) once more makes clear. The reply is that the ordinal numbers within the definition, i.e. 'first' and 'second', can be understood atemporally, and so need not be understood in terms of B-series relations. He says this because they have 'multi measuring' functions, which means that not only can they be used to describe temporal objects, but also can they describe abstract and spatial objects (which, obviously, do not have temporal relations holding between them). For this reason, the mere reason the definition invoked numbers does not mean it invokes B-series relations, and for this reason Oaklander's objection to Mellor's third definition can be rejected.

This completes my discussion of whether we can define B-relations in terms of A-properties. I conclude that we can (or at least, no good reason has been given for thinking that we cannot). And so, I conclude that the A-theorist is better placed than the B-theorist in accounting for the asymmetry of the B-relations, and so in accounting for the direction and flow of time. In other words, I have argued that the B theorist needs to explain 'why... so-called B-relations will still obtain among events once the detenser has robbed time of all [A-properties]' (Craig, 2000: 157) and argued that they cannot, but that the A-theorist can.

It is worth emphasising at this point that this conclusion is fully in line with that of McTaggart on this issue. Recall the descriptive statements given by McTaggart on

the A-series and the B-series, that the A-series is the essential feature of time, and that the B-series cannot exist without the A-series. What is more, since there can be no temporal series without the A-series, what is left is described as the C-series which, according to McTaggart (1908: 461 - 462), is an atemporal series of permanent relations. More precisely, there is a great deal of resemblance between the B-series and the C-series, not only the B-series and the C-series co-share all the events, but also the C-series have them in the exactly same order as arranged in the B-series. Despite being highly similar with each other, the C-series is not temporal, so the difference between the two series, defined by McTaggart (1908: 461 – 462), is that the content in the B-series is defined by genuine *earlier than* and *later than*, while the content in the C-series is ordered by something other than *earlier than* and *later than* relations, and this is why it cannot be considered a temporal series. What McTaggart (1968: 240) has in mind for the C-series to have is the relations described as 'included in' and 'inclusive of'. By making this claim, McTaggart tries to prove that it is possible that the C-relations appear as earlier than and later than relations, and that C-series could lead to the B-series; but this is not possible, for the reason that it is clearly stated that the B-relations are not capable to exist without adding A-properties to it. So, McTaggart concludes, in order to turn the C-series into the B-series, we must also have A-properties. In effect, the discussion above demonstrates why this is so in greater detail.

Section 7: Can the B-theorist deny there is a problem?

At this point the B-theorist is still struggling to establish a theoretical base upon which he can claim that the B-relations suffice for the existence of time. However,

there is one response that we have not yet considered fully. That response is to simply deny that there is a problem here. It is open to the B-theorist to maintain that we can account for the flow and direction of time very simply in terms of the fact that human beings can discern it without the need of defining. We can look to Oaklander (1987: 17) again to make this point. He says that we do not require any demonstration of an actual direction to time, as the direction is given in our *perceptions*. If one event occurs before another, this just means that we *perceive* the first as happening first, and the second and happening second.

There is one simple comment to make about this. This is that it is somewhat ironic that the B theorist says that we can perceive the direction of time if it is not objective, intrinsic difference, because perception is usually taken to be veridical. If we perceive something as being the case, then it is the case independently of us. Oaklander does say that a '*temporal relation of succession'* really does obtain (i.e. intrinsically and objectively) among the events, but that this is so seems to be equally baffling as the B-relations' ability to obtain without the A-properties. So there really does seem to be a genuine problem for the B-theoriest to solve here.

Section 8: Temporal Flow/Temporal Becoming: Illusion or Reality

I have now gone through all three of Mellor's definition over the relations 'earlier than' and 'later than' in terms of the A-Theory. Since these B-relations can be explained by the A-Theory and reduced into the A-properties, the debate upon the matter of spatializing time is now settled. Nevertheless, the B-theorists is a stubborn foe, and losing one argument is not really enough to stop them from arguing for the

other aspects of the B-Theory. In the next section, I will look into the B-theorist's argument that, instead of being objective, temporal becoming exists dependently of human consciousness. (NB This is different to saying that we can perceive the direction, for unlike that claim, this claim does not suppose the difference is intrinsic to the timeline, i.e. "out there" to be discerned. Rather, our discerning of a direction is supposed to *constitute* it having that very direction.)

Recall the B-theorist statement, according to Price (2011), that the A-theorist begs the question by assuming that our experiences of the flow of time are part of the features of nature while they are really not. In other words, the flow of time is only subjectively real and is not able to exist without experiencing subjects. Furthermore, in the absence of minds, there is no such thing as tensed facts or temporal becoming, the only thing that exists as time is the tenseless temporal relations. With regard to this claim, there are a number of important questions that have been brought up in order to justify the legitimacy of such account. For example, one might ask why it is possible for the B theorist to know that temporal becoming is only a mental ramification rather than a physical feature, or one might also ask whether the tenseless events exist as events of physical world, if that is the case, then whether temporal becoming should be seen as absent from both mental and physical worlds? All the questions are pressing for the B theorist, so what can they say?

The B theorist starts his argument with the explanatory statement that '*temporal becoming exists in the mental realm, but is absent from physical reality*.' (Craig, 2000: 168) At first glance, this explanation could be legitimate, for it offers an account of the phenomenon of our perception of time. However, if one takes a closer look, it is not difficult to find that there are some significant problems with this view. For instance, it is explicit in this view that the reality of the experiences

of each and every one of us is divided into two different components by the B theorist, Firstly, our consciousness is supposed to itself exist temporally, i.e. to take place over time. Second, the world itself, within which our consciousness exists, is supposed to be a tenseless physical world. But to justify such separation of the reality of our temporal consciousness and the non-temporal physical world seems, on reflection, to make dubious sense. This separation of reality into the concious-temporal and the physical-non-temporal is what Capek calls an ‘absurd dualism’. In order to explain Capek’s moniker, I appeal to Craig once more, and his example of two possible worlds.

As described by Craig (2000: 168), we are to consider two possible worlds, one that involves only mental beings, which go through temporal becoming of consciousness; and the other is similar, but with some of its mental beings being embodied in physical form, say, human bodies, which exist tenselessly and do not experience temporal becoming. In the first possible world, since there is no physical being, it is safe to say that it is temporal becoming that defines the mental being in this world; and it demonstrates the contradiction of this separation by assuming the second possible world:

> The physical states of the body at some t tenseless induce mental states at t, but that time may not be present for the mind and so, as past or future, such states are non-existent. Conversely, the mind may will to cause a bodily movement now, but the effect is not produced now, but tenselessly, but then the effect exists even when the mind is not now producing it. (Craig, 2000: 168)

This leads a discussion to Ferré's criticism, expressed here by Grunbaum:

> Becoming is mind-dependent because it is not an attribute of physical events per se but requires the occurrence of certain conceptualized conscious experiences of occurrence of certain events. (Grünbaum, 1971:197)

With regard to this statement Craig gives his comments and addresses a few issues, and among those issues, there are two concerns with this B theorist claim that are noteworthy. The first is the issue of temporal location and that of transiency.

If time consists of only tenseless events arranged in a earlier than/later than relations, then the B-theorist is obliged to explain why one has *constant* perception of a dynamic temporal position. Let us call this constant perception 'now-awareness'. For example: imagine there are two temporal events that happen at different moments, m_1 and m_2. One's perception of time as the event at m_1 happens is different from the same person's perception at m_2. Obviously, one's now-awareness at m_1 is different from the now-awareness at m_2. However, according to the B-Theory, all temporal events exist tenselessly, for this reason one's now-awareness at m_1 is supposed to be the same as it at m_2. In other words, if one adopted the B-theorist view about this, then it would cause a great deal of confusion as to the temporal locations of these events because the now-awareness of them are the same. Baker (1975: 230) replies to this inquiry in favour of the B-Theory by claiming that there is a simultaneity class of events associated with every temporal position, and one's now-awareness should be considered as part of this simultaneity class. That is to say, one's now-awareness at m_1 is determined by the simultaneity of class

at m_1, and due to the simultaneity of class at m_1, one's now-awareness at m_1 cannot be perceived at m_2.

On the face of it, this reply seems reasonable and does explain why one has the now-awareness at m_1 that is specifically associated with m_1 rather than m_2. Be that as it may, such a reply is only legitimate when the precondition is that every now-awareness at every moment must exist tenselessly and there is no temporal dynamics whatsoever between these now-awarenesses. With that being said, this reply turns out to be unsatisfying if one asks why one should not have the now-awareness of (say) m_1 *simpliciter*, given everything is tenseless. When one is having an awarenes of m_1 it seems there is something special about this now-awareness compared to a now-awareness that one is not having (say, the now-awareness of *m2*). But what can make this special? The answerm, it seems, can only be that when one is having the now-awareness of *m1*, that *m1* is present but *m2* is not.

The above point can be pressed further. If one has a now awareness of m1, when that it present, and then has a now-awareness of m2 when that is present, this entails that there is a transformation within the now-awarenesses at different moments. But the B-theorist cannot make sense of this transition, for they cannot allow that it takes place due to the flow of time from m1 to m2. But, without being able to offer such an answer, they can offer no answer at all.

The other problem with the mind-dependence view is on the matter of ordering in transiency. On the thesis of mind-dependence proposed by Grünbaum, the 'past, present and future status of events is not determined by any simple characteristics of sensations associated with it.' (Baker, 1979: 348) This assertion implies that it does not necessarily require a specific *order* for different now-awarenesses to be perceived in the tenseless world of the B-Theory. If this is the

case, then this implication directly causes a problem for the B-theorist. The problem is that, technically speaking, one should be able to experience *any* now-awareness at *any* random temporal position without a temporal ordering which arranges the sequence of one's now-awareness, which is obviously dubious. However, Baker offers a reply, saying that there is a tenseless B-series that determines the order of one's now-awarenesses, and such a series is supposed to be associated with the series of one's physical states:

> [T]he order of those mental events which constitute awareness of physical events depends on the order of the physical events which cause them together with the distances and velocities of the influence chains reaching the percipient. (Baker, 1975: 225)

Again, the assumption made here is that a tenseless B-series determines the sequence of one's now-awarenesses, which are in close in association with the series of one's physical states. Yet, Baker still owes the opponent of the B-Theory an explanation why it should be the case that the now-awarenesses at random temporal position correlated with one's physical states is tenseless, rather than successively present. As a consequence, the B-theorist's response to the problem of transiency is also unsatisfying.

At this point I have gone through the noteworthy views and comments in terms of mind-dependence of becoming, and the B-theorist has not provided any adequate evidence to prove that temporal becoming exists only in the mental sphere. So far, I have found the explanations wanting.

The argument for mind-dependence of becoming is one approach the B-theorist attempts to get through, and it has failed. However, there is one other approach the B-theorist has choosen to adopt for mind-dependence of becoming, and that is to reject the becoming of mental states. However, in my opinion, this strategy is invented out of desperation, as it claims not only that the objective flow of time is an illustion, but also that the *apparent* flow of time (i.e. in our experiences) is also an illusion. Consider one such philosopher, J.J. C. Smart, who has defended this approach. He says:

> Now most people do seem to be subject to the metaphysical illusion of an absurdity (flow of time, advance through time)... However, the description of this absurdity need not itself be done absurdly: the illusion of the septic sort of change may involve change, i.e., the sort of change that can be described four-dimensionally in terms of non-similarities of time-slices of the brain of the metaphysician who has the illusion of time flow. (1972: 11)

This claim goes completely against the recognised facts of lived human experience. We are supposed to think that, rather than being a persisting single agent who experiences things, there are in fact a series of experiences had by different times slices of an agent. These time slices each have their own non-temporal experiences, but they each somehow fall into the illusion of thinking those seperate experiences are experiences of one thing that they take themselves to be (but are not), and so fall into the illusion of thinking that they are undergoing a single changing flow of experience (when they are not). This, I submit, is absurd. I don't know quite how to argue for this absurdity, because it seems to me such an egegious error that it is

hard to say anything more than: this cannot be right. Perhaps the following quote from Eddington, who agrees with me on this matter, helps here:

> If I grasp the notion of existence because I myself exist, I grasp the notion of becoming because I myself become. (Eddington, 1964: 102 - 103)

That is to say, our mental states, as an essential part of our existence, should be regarded as undergoing temporal becoming. That they do so seems to be such a central feature of our existence and experience that we simply cannot be mistaken about this fact, i.e. the fact that *experience itself* is subject to temporal becoming. That is, it would be too much of an ontological price to pay to deny mental becoming. Despite this, the B-theorist carries on his argument against this primary component of our existence, and the point he intends to argue for is, according to Grünbaum (173: 315 - 316), that it is true that there exists a diversity of the now-contents that is through consciousness, and the order of these now-contents is temporally arranged, but this does not suggest that there should be awareness of becoming or orientation of time that determine these now-contents to be perceived through consciousness. Furthermore, Grünbaum believes that not only do we have a continuum of states of awareness, but also have we an instant awareness of succession, which, according to Grünbaum, is an important component of the definition of now:

> [T]he now-content, when viewed as such in awareness, includes an awareness of the order of succession of events in which the occurrence of that awareness constitutes a distinguished element' (Grünbaum, 1973: 325)

All this is rather difficult to understand, and the B-theorist seems to be committing themselves to rather obscure positions in order to defend their view. That is, despite this attempt at clarificaiotn, it is still difficult to understand the B-theorist's statement as to what mental becoming is, given that it is supposed to be happening tenselessly at instants. It is also unclear, *why* the B-theorist should want to defend this view, given how incredible it is, i.e. that *mental* becoming is just an illusion as we exist through time. What seems surprising to me is that, as a B-theorist, Grünbaum actually acknowledges the nowness of experience, as he states:

> ...nowness of an event requires conceptual awareness of the presentational immediacy of either the experience of the event or...of the experience of another event simultaneous with it. (1971: 206)

According to this description, Grünbaum explicitly accepts the notion of 'the presentational immediacy of experience', however, it is very odd that he does not really provide any explanation of how he, as a B-theorist, understands this concept. What is more, another comment on this matter made by Craig is that the way Grünbaum argues for the mind-dependence of becoming actually seems to *entail* that temporal becoming actually exists in mental states. As Craig puts it Grünbaum's view is that:

> [T]he notion of an event's occurring now is made in terms of its simultaneity with a sentient subject's experiencing the event while being aware that he is experiencing the event. (Craig, 2000: 173)

The problem with it is that it makes explicit use of the present tense. If one reads this tenselessly, we get the problem that all events would be *occuring now*. It seems impossible that Grünbaum's view can do a good job justifying the mind-dependence of becoming, given such an view can only be understood in tensed terms. Since the purpose of the view is to address what makes a specific event, say e, to be present, Grunbaum must avoid presupposing that one *is* (i.e. understood in the present tense) experiencing event *e*. For if he does presuppose this, being present is definitely more than just an illusion. However, Grunbaum does not avoid this difficulty, and nothing he says explains how it can be avoided. I think we can thus conclude that unless more is said, B-theorists cannot account for the idea that our experience of the flow of time is nothing but an apparent experience.

Conclusion

In this chapter I have argued that the A-theoriest can account for the flow of time, by explaining the direction of time and the asymmetry of the B-series. I have also argued that the B-theoriest cannot easily do this, and cannot account for the nature of our termporal experiences in any other plausible way. I do not claim that I have covered every possible response that the B-theorist could make here. But I believe I have made it plausible that the B-theorist faces considerable difficulties, and would have to adopt a less satisfying view if they were to maintain their position. Thus, unless there is good reason to think the A-theory fares worse when explaining other aspects of time, we have good reason to consider the A-theory to be true. In the next chapter I turn to another such aspect of time that I think is crucial - that of persistence over time. I argue that the A-theorist fares better here too, and so argue

that the combined weight of the conclusion of this chapter and the next mean we should reject the B-theory altogether.

Chapter 3

Against the B-theory [Part 2]

Introduction

Despite the fact I have demonstrated in the last chapter that the B-theory is more implausible than the A-theory with regard to the issue of the flow of time, this does not show that the B-theory must be rejected. It still may be that the B-theory has some major advantages in other respects. In this chapter I examine what I consider to be the other major aspect of temporality that any adequate theory of time must account for, namely, the persistence over time of material objects. I argue that in this respect too, the A-theory is more plausible than the B-theory. And this, combined with the result of the previous chapter, thus gives us a sufficient reason for rejecting the B-theory in favour of the A-theory.

In more detail, the two theories about persistence over time I discuss in this chapter are called ‘endurantism’ and ‘perdurantism’. Each of these theories offers us an analysis of how physical objects exist in a temporal sense. In this chapter I investigate these two theories, argue that we ought to accept endurantism, and argue that the B-theory is incompatible with that view. And so, I argue, in combination with the conclusion from the last chapter, we should reject the B-theory outright.

Specifically, then, the structure of this chapter is as follows: In section 1 I introduce perdurantism and endurantism. In section 2 I then offer a positive argument for endurantism. In section 3 I consider the problem of temporary intrinsics, which some have argued necessitates that we in fact accept perdurantism

over endurantism. In section 4 I argue that we can reject this claim by accepting an endurantist solution to the problem of temporary intrinsics. Finally, in section 5, drawing upon the discussion in the previous sections, I argue that the B-theory is incompatible with endurantism, and so conclude that it should be rejected outright.

Section 1: Endurantism vs. Perdurantism

I begin, then, with a brief overview of the two positions themselves.

Endurantism is the view that objects exist wholly and completely at each time that they exist. This means that if an object x exists at any two times t1 and t2, then x is wholly present at t1 (there are no temporal parts of that object that do not exist then) and is wholly present at t2 (there are no temporal parts that do not exist then either). It also means that if an object x that exists at t1 and an object y exists at t2, then if x and y are in fact the same object, then x and y are *literally* numerically identical - x and y are *literally* one thing, and not two. To illustrate, consider a table that exists at t1. Suppose it is sanded down and painted red. As doing these things does not destroy the table it will survive to t2. If we label the table that exists at t1 “T1” and the table that exists at t2 “T2”, endurantism has it that T1 just is one and the same thing as T2 even though T1 and T2 have different properties. And so, endurantism also entails that objects can remain literally identical over time despite undergoing a change in properties.

Perdurantism, by contrast, is the view that objects do not exist identically over time in a literal sense. On this view, objects have temporal parts that exist at different times, and a single persisting object is made up from the sum of its temporal parts.

As such, if an object x exists at t1 and t2, it does so by having a temporal part of it that exists at t1 and a temporal part of it that exists at t2. Thus, the things that exist at t1 and t2 are not themselves *literally* identical. Instead they are merely *parts* of some extended thing, and it is *the* whole extended thing only that can be said to be literally identical with itself. Consider the table again. According to perdurantism, T1 at t1 is not the same thing as T2 at t2. Indeed, T1 and T2 are not themselves tables. Rather they are parts of some larger temporally extended object that is a table. And so, perfurantism also entails that objects cannot literally exist identically over time despite undergoing changes. Rather, one object can be replaced by another with different properties, but these two objects can be part of some whole.

Section 2: An Argument for Endurantism

In this section I wish to offer a novel argument in favour of endurantism that is based upon considerations touched upon in the last chapter when discussing mental becoming. There I argued, in effect, that we ought to take it as a datum that we, as mental beings, exist identically over time and undergo changes in our experiences. I linked this idea there with the idea that there must be a flow of time *within* our experiences. But here I wish to put the issue of the flow of time to one side, and instead consider what this entails for our existence, as mental beings, over time.

Before I give my argument, I first want to make clear that I am not here adopting a dualist viewpoint (nor am I denying it). That is, when I describe us as being ‘mental beings’ I do not mean to suggest that we are not also physical beings,

and so that description is to be taken as being wholly compatible with the idea that our mental states supervene upon our physical states.

With the above said, then, what does it mean to say that we are mental beings that exist identically over time and undergo changes in our experiences? Is this compatible with the idea that do not literally exist identically over time as mental beings, but are rather made up from a series of time-slices (i.e. temporal parts) as the perdurantism maintains? I think it is not. As I said in the previous chapter, if we were in fact made up of such time-slices, we would be suffering a grand illusion in thinking of ourselves as being a single being that undergoes changes in our experiences. For on the perdurantist view we are not such beings. Instead we are many mental beings, one replacing the next, and each has its own mental experiences that are entirely seperate from the next. The mental experiences of these distinct beings are related by so-called links of memory and continuity, but all this means is that their experiences have some overlap in their content and are similar to each other in various respects. But this destroys our ordinary conception of ourselves entirely. On this view, each of us at any moment is as seperate, mentally speaking, from “ourselves” at any another moment as we are from each other. And this, I think, is an absurd view.

To see what I mean by the above in more detail, and to see how implausible this perdurantist view is a consequence, consider what a person is once more, according to perdurantism. A person is a series of independent objects, person-stages, that have their own experiences and are related to each other in various ways. Now, let us suppose that we can take each of the person-stages that make up a person over time, and let us now suppose that instead of having them arranged over time, we instead have them arranged across space at a single time. That is,

suppose we have what the perdurantist considers to be a “whole person” (i.e. all the different person-slices that make up a person) all stood next to each other in a long line. All of these person-stage, being more-or-less instantaneously existing things, exist for a mere instant, stood next to each other, and then go out of existence. It would be, on the perdurantist view, that we have a whole life occuring at one moment.

If we arrange our person-slices in the order that they would have had were they to be arranged over time, putting the earliest stages on the left and the latest stages on the right, then each of the beings (except the leftmost) would seem to “remember” being the beings to their left. They would talk about their “past” and “future”, and consider the other beings in the line as “being them” in the past and the future. But despite this, it seems clear, each of these beings is radically mistaken. None of them has any past, and none of them has any future. Each is a mere instantaneous thing, and mistakenly believes that the other beings in the line are “them”. Their so-called “memories” are not memories at all, but illusions of memories. What they seem to remember never happened to them at all. Instead what they seem to remember is happening in another, entirely seperate sphere of consciousness, somewhere down the line to their left.

So, the line of seperate experiencing beings, it seems to me, is obviously not a single person at all, but a long line of deranged beings with false beliefs about themselves, their past, and their futures. But now consider that if perdurantism is right, this is what we all are. It does not matter that the other temporal slices of us exist at different times rather than right now in different spatial locations, because we are just as distinct and just as seperate from those other slices as we would be if they did exist right now. And so, if perdurantism is right, none of us has a past or a

future either, and each of us, at each moment, is a deranged instantaneous being with false beliefs about ourselves, our futures, and our pasts.

For the above reason, then, I think perdurantism is absurd. Although it is true that this absurd consequence only occurs for experiencing beings like ourselves, and not for ordinary material objects like tables and chairs, it nevertheless has this consequence for experiencing beings like ourselves, and so should be rejected. Endurantism, on the other hand, fits perfectly with how we consider ourselves to be. According to endurantism, each of us exists literally identically over time, so that one and the same subject has each of the experiences we undergo during our lives. We can rightly consider ourselves as having a past and a future, for we, the very thing that is now experiencing the present moment, also experienced past moments, and will experience future moments. We are not merely related to certain distinct past and future beings in virtue of having experiences that are similar to theirs in certain respects and overlap in their contents - we literally had and will have *those very experiences* with *those very contents*. None of us is deranged. Each of us had a past, and each of us has a future.

Now, I think the above argument is a very strong one indeed for believing endurantism. But, I do not think it is absolutely conclusive. It may still be that endurantism can be shown to be somehow incoherent, and we may be *forced* to admit that we are, in fact, deranged, as perdurantism entails. I now turn to what is usually considered to be the main positive argument in favour of perdurantism. It has been supposed to show that endurantism itself must be rejected. I, however, will argue that it is a weak argument and, in light of the above argument, gives us no reason at all to reject endurantism.

Section 3: The Problem of Temporary Intrinsics

The problem of temporary intrinsics was put forward by Lewis in order to defend perdurantism. According to him, the only solution to the problem is to adopt perdurantism and reject endurantism. An intrinsic property is supposed to be a property that an object has in virtue of how it is *in itself* and not in virtue of any other thing. A paradigm example of an intrinsic property is supposed to be its shape (e.g. *being triangular*) - objects have their shape purely in virtue of how they are in themselves (however, as we will see, the problem of temporary intrinsics puts pressure on this example being correct). By contrast, *being a brother* is supposed to be an extrinsic or relational property, because an object is a brother only in virtue of the existence of some other thing, namely, a male sibling of the object in question. The problem of temporary intrinsics itself is one of how to account for the possibility of the intrinsic properties of an object changing over time. For example, when a person drives a car, the shape of this person is *bent*; but when he stands next to the car, the shape of this person is *straight*. In the light of this example, this person possesses different intrinsic properties at different times, he has the property of *being bent* when he drives the car at one time, and has the property of *being straight* when he stands straight outside the car at another. What Lewis tries to achieve by presenting the problem of temporary intrinsics is to clarify how the change of these properties possibly takes place. One might think this is not much of a problem. But, once one realises that intrinsic properties are often incompatible with each other, and when a being changes in its intrinsic properties it can come to have an intrinsic property that is incompatible with the one it had before whilst remaining one and the

same thing as itself, it becomes one. To see why consider the following argument (adapted from Merricks, 1994: p168):

The Problem of Temporary Intrinsics

1. *O* at t is identical with *O* at *t** [assume for reductio]

2. *O* at *t* is bent. [premiss]

3. *O* at *t** is straight. [premiss]

4. If *O* at *t* is identical with *O* at *t**, then *O* at *t* is *F* iff *O* at *t** is *F*. [Indiscernibility of Identicals]

5. Therefore, *O* at t is bent and straight. [RAA, (1), (2), (3), (4)]

The conclusion here serves to complete the reductio because being bent and being straight are incompatible intrinsic properties, and it is obviously impossible for an object to have two incompatible intrinsic properties. In order to deal with this contradiction, Lewis introduces three solutions that involve different approaches to the problem. He explicitly rejects the first two and accepts the third, which is to accept perdurantism. In what follows I go through them one at a time. But, I start with Lewis's second solution first, for reasons that will become clear:

Lewis's second solution:

Second solution: the only intrinsic properties of a thing are those it has at the present moment. Other times are like false stories; they are abstract representations, composed out of the materials of the present, which represent or misrepresent the way things are. When something has different intrinsic properties according to one of these ersatz other times, that does not

> mean that it, or any part of it, or anything else, just has them - no more so than when a man is crooked according to the Times, or honest according to the News. This is a solution that rejects endurance; because it rejects persistence altogether. And it is even less credible than the first solution. In saying that there are no other times, as opposed to false representations thereof, it goes against what we all believe. No man, unless it be at the moment of his execution, believes that he has no future; still less does anyone believe that he has no past. (Lewis, 1986: 204)

In giving this solution Lewis has in mind the presentist position. If presentism is true, then there are no other times at all, and so as objects exist only in the present, if they go from being bent to being stright, they are then straight, but there is no longer any time at which they are bent. (Interestingly, Lewis seems to suggest here something like the ersatzer presentist view which was discussed in chapter 1, many years before Craig Bourne defended it.) Now, I actually find Lewis's remarks here to be too strong, for he seems to want to paint presentism as the view that persistence *itself* is impossible on the presentist view, and rejects the solution for this reason. But, clearly, his argument for this is far too quick here. From what he says it is far from clear that one cannot believe that one has past and a future if one is a presentist, as one will be right in believing that one *did* exist and that one *will* exist in the future. And, in fact, the presentist solution need not turn on the fact that other times are like 'false stories', but instead on the idea that we must pay close attention to tense in our statement of the problem of temporary intrinsics argument. That is, we can re-write the argument as follows (here, the 'is' is to be read throughout as expressing the present tense):

1. *O* existed at t and is identical with *O* that exists at *t** (i.e. now) [assume for reductio]

2. *O* at *t* was bent. [premiss]

3. *O* at *t** is straight. [premiss]

4. If *O* existed at *t* and is identical with *O* that exists at *t**, then *O* that existed at *t* was *F, is F or will be F* iff *O* that exists at *t** was *F*, is F, or will be F. [Indiscernibility of Identicals]

5. Therefore, *O* that existed at t is, was, or will be bent and was, is, or will be straight. [(1), (2), (3), (4)]

But here, with addition of tense, 5 is perfectly possible, and there is no absurdity. However, be this as it may, I have already rejected presentism for independent reasons, and so I consider this solution no further.

I now consider Lewis's first solution, which I find far more plausible (although Lewis himself does not):

Lewis's first solution:

[C]ontrary to what we might think, shapes are not genuine intrinsic properties. They are disguised relations, which an enduring thing may bear to times. One and the same enduring thing may bear the bent-shape relation to some times, and the straight-shape relation to others. In itself, considered apart from its relations to other things, it has no shape at all. And likewise for all other seeming temporary intrinsics; all of them must be reinterpreted as relations that something with an absolutely unchanging intrinsic nature bears to different times. The solution to the problem of temporary intrinsics is that there

> aren't any temporary intrinsics. This is simply incredible, if we are speaking of the presence of ordinary things.... if we know what shape is, we know that it is a property, not a relation. (Lewis, 1986: 204)

As stated above, the core idea of this solution is to reject that shapes (and all other intrinsic properties that can be possessed at one time but not another) are in fact intrinsic properties, and instead affirm that they are relational properties, i.e. relations between objects and times. Thus, according to this solution a thing can change in its intrinsic properties over time by coming to bear a different relation to a different time. In the case of O in the argument stated, O bears the being-bent-at relation to t when he is driving his car at t, and then O bears the being-straight-at relation to t* when he is standing next to his car at t*. The idea is that, contrary to what we might think, O stays exactly the same intrinsically during this change, and that what changes is *O*'s relations to the times he exists at, therefore, intrinsic properties are not intrinsic but are instead a matter of the relation occurring between objects and specific times. What is rejected then, on this solution, is premises 2 and 3 of the problem of temporary intrinsics argument. In terms of that argument we can say:

1. *O* at t is identical with *O* at *t** [assume for reductio]
2. *O* bears the being-bent-at relation to *t*. [premiss]
3. *O* bears the being-straight-at relation to *t** [premiss]
4. If *O* at *t* is identical with *O* at *t**, then *O* at *t* bears relation R to x iff *O* at *t** bears relation R to x. [Indiscernibility of Identicals]
5. Therefore, *O* at t bears the being-bent-at relation to t and the being-straight-at relation to t*. [(1), (2), (3), (4)]

But here, 5 is perfectly possible, and not an absurdity, so we have a solution to the problem. Of course, Lewis himself rejects this solution. We will return to his rejection later. For now, I press on with the final third solution that Lewis endorses:

> Lewis's third solution:
>
> Third solution: the different shapes, and the different temporary intrinsics generally, belong to different things. Endurance is to be rejected in favour of perdurance. We perdure; we are made up of temporal parts, and our temporary intrinsics are properties of these parts, wherein they differ one from another. There is no problem at all about how different things can differ in their intrinsic properties. (Lewis, 1986: 204)

The perdurantist solution is clear. Things cannot literally undergo a change in their intrinsic properties - that is, one and the same thing cannot *itself* possess one intrinsic property at one time and another at another. Instead, one thing can possess an intrinsic property at one time, and another can possess another intrinsic property at another time, and these *two* things can be related to each other in various ways so that they are to be considered parts of some whole that contains *both* of these things. So, in this case, O at t is not literally identical with O at t*. Rather, O at t is one thing, and O at t* is another. And so here what is rejected is premise 1 of the problem of temporary intrinsic argument. Instead of saying that O at t is identical with O at t*, the perdurantist says that O at t and O at t* are parts of some whole. So, in terms of the argument we can say:

1. *O* at t and *O* at *t** are part of some whole W [assume for reductio]

2. 2. *O* at *t* is bent. [premiss]

3. *O* at t* is straight. [premiss]

4. If *O* at *t* and *O* at *t** are part of some whole W then W has a part at t that is bent and a part at t* that is straight. [premiss]

5. W has a part at t that is bent and a part at t* that is staight. [1,2,3,4]

And 5 here is again perfectly possible, and so not absurd.

So, it is clear that Lewis's perdurantist solution is indeed a solution to the problem of temporary intrinsics. But then, so is the relational properties solution considered above. The situation we are in then, is this:

I have presented an argument against perdurantism in section 2 that shows it to have an absurd consequence that we should want to avoid at all costs. We have considered the problem of temporary intrinsics which admits of two solutions. One of them is perdurantism, the other is the relational properties solution. But, because perdurantism has absurd consequences for the reasons I have given, we should only adopt the perdurantism solution if the relational properties solution can be shown to be incoherent in some way or have a consequence that is more absurd than the one that perdurantism has. In what follows, I argue that it is clear that neither of these things can be shown about the relational properties solution, and so that solution (or one related to it) should be adopted, endurantism endorsed, and perdurantism rejected.

Section 4: The Relational Properties Solution

Before we assess the relational properties solution, it is worth pointing out that there are in fact alternative solutions along the same lines as it. This will be useful because the other alternatives turn out to be inadequate for reasons that do not related to the relational properties solution, and so considering them will give us a better appreciation of the relational properties solution itself.

One alternative version of this solution attracts some philosophers' attention and endorsement, namely, the time-indexed solution. Smith and Oaklander introduce this version by replacing the temporary intrinsic properties, such as *being bent* or *being straight* with time-indexed properties such as *being-bent-at-t* and *being-straight-at-t*. These do not express relations, but are monadic properties with times built into them. As Craig puts it:

> The hyphens are meant to signal that what is at issue here is not a relational property specifying a relation between an object O and a time t, but rather a monadic property which is ascribed to O simpliciter. (Craig, 2000: 185)

If we apply this solution to the original argument, we get:

1. *O* at t is identical with *O* at *t** [assume for reductio]
2. *O* is bent-at-*t*. [premiss]
3. *O* is straight-at-*t** [premiss]
4. If *O* at *t* is identical with *O* at *t**, then *O* at *t* is F iff *O* at *t** is F. [Indiscernibility of Identicals]

5. Therefore, *O* at t is bent-at-t and straight-at-t*. [(1), (2), (3), (4)]

And once more, 5 is perfectly possible, and so not absurd.

However, despite the fact it does solve the problem, this is not an adequate view. The main problem here is that if the properties being-bent-at-t and being-straight-at-t* are not reducible to more simple intrinsic properties (which they cannot be if the solution is to be a genuine one) then this means the properties are primitive, and so simple and unanlysable. But then, there turns out to be no connection between, say, *being-bent-at-t* and *being-bent-at-t**. Despite the fact these properties seem to share something in common, on this view they do not. These two properties are entirely separate primitive properties that bear no more relation to each other than *being red* and *being square* are usually thought to. This is an unacceptable view.

Another alternative solution is known as “adverbialism”. Again, Craig summarises this view succinctly as:

> [A] property is exemplified… temporally rather than timelessly. The time at which an object possesses a property is neither a relatum nor a constituent of the property, but characterizes the possessing of the property by the object, just as temporal adverbs modify verbs. (Craig, 2000: 186)

As characterized in this description, the search for a way out of the contradiction is now focused on the adverbs, which are considered as ‘temporal qualifiers’. Johnston (1987: 128) defends this view, arguing that such qualifiers are closely connected with how an object has properties and quite frequently happen to be adverbs. To show

this with an example, consider a girl named Lucy who dies her hair brunette from blonde. Then we can say Lucy is *presently* brunette, but she is *pastly* blonde haired. By expressing things in this way, Johnston claims to be able to dodge the contradiction in the problem of temproary intrinsics argument. He thinks it is true that objects possess intrinsic properties at different times, but that it is '*possessing*' that should be the subject that is modified instead of the object itself or the properties. To formulate this adverbialist solution in terms of the argument itself again we have:

1. *O* at t is identical with *O* at *t** [assume for reductio]
2. *O tly* bent. [premiss]
3. *O* is *t*ly* straight. [premiss]
4. If *O* at *t* is identical with *O* at *t**, then O at t is *tly F* iff *O* at t* is *tly* F. [Indiscernability of identicals]
5. O at t is *tly F* iff *O* at t* is *tly* F. [1,2,3,4]

Once more, 5 is perfectly possible, and so not absurd.

Now, this solution is all well and good, but it turns out to reduce down to the relational account anyway, albeit a more complicated version of it. Lewis himself makes this point asking: 'What does standing in some relation to straightness have to do with just plain being straight?' (Lewis, 1988: 66) To be more specific as to this reply, Lewis (1988: 66) argues that being straight on this account is actually a *three-place* relation that exists between the object *O*, being straight, and some time t. In short, it avoids temporary intrinsics by claiming that an object being a certain shape at a certain time is equivalent to saying that the object stands in certain relation to the property of being a particular shape and a time.

Jonathan Lowe finds this reasoning of Lewis's dubious here as he claims that it is not a three-place relation standing between the object *O*, being a certain shape, and some time, but, as Craig puts it 'the holding of the two-place relation of property exemplification like O's being F is related to a time.' (Craig, 2000: 188) Due to this statement, when related to time *t* the object *O*'s property of being bent obtains, and when related to time *t** the object *O*'s property of being bent does not. What is more, another issue Lowe and Lewis disagree with each other on is the definition of 'just plain being straight' in Lewis's question above-mentioned, Lowe thinks that what it means is that it may 'denote some atemporal mode of property exemplification' (Lowe, 1988: 73); and therefore does not see any reasons why one cannot reject the idea that there are 'changeable, persisting physical objects can ever correctly be described as 'just plain being straight'.' (Lowe, 1988: 73) I do not think that Lowe offers a very convincing comment on Lewis's objection to adverbialism, however, because it looks very likely that Lowe's view is backed up by the relationalist view when he states that there is a relation between the object O's *being bent* and some time. But, as above-mentioned, the relationalist view does indeed face the problem of giving up the intrinsic nature of shape properties.

Finally, then, let us consider the relational solution to the problem of temporary intrinsics itself. Lewis says simply that, if we know what an intrinsic property is, we know that shape properties are intrinsic, and rejects the solution on this basis. I admit that the idea that shape properties are intrinsic is an intuitive one. But I do not think the intuition is strong enough to reject this endurantist solution to the problem at hand. We do ordinarily think of shape properties as being intrinsic, but this can be explained by the fact that we view the world from a temporal perspective. We only ever see one time, as it were, and when we consider an object at a single

time, we need only look at the object itself at that time to tell that it has a particular shape. We don't need, that is, to consider any other *object* existing at that time. And so, it seems to me, that we can explain our intuition that shape is intrinsic in such terms. We can even define a notion of being intrinsic at a time, as follows:

> A property P possessed by O is intrinsic at a time t iff O has P at t in virtue of how O itself is at t irrespective of how any other thing O* is at t.

And this notion, it seems to me, is what we ordinarily mean when we say that shape is an intrinsic property. That it turns out that shape is not *technically* intrinsic when we consider time does not seem to me to cause any problems. We usually do not consider times to be 'objects' that things can bear relations to, and even if this is technically true it doesn't enter into our usual thoughts regarding whether a particular property is intrinsic or not. So, I reject Lewis's view that this intuition is strong enough to reject endurantism in favour of perdurantism.

There is one more point to be made to bolster the argument above. This point is that, as I argued in section 2, the consequences of accepting perdurantism are *extremely* counterintuitive - if it is true, it turns out that each of us possesses deranged beliefs about the future and the past and our own selves. Given this, the correct way of proceeding here is to weigh up the counterintuitive consequences of accepting perdurantism and of accepting endurantism. So, on the one hand, we can accept that shape is an intrinsic property, but then are foced to admit that each of us is deranged. Or, on the other, we can accept that properties are not strictly intrinsic, but relational, but allow that none of us is deranged. It seems quite clear to me the

latter option is by far the more reasonable, especially given my comments above regarding the status of our intuition regarding the intrinsicality of shape.

Thus, I conclude here that the problem of temporary intrinsics gives us no reason to reject endurantism in favour of perdurantism. As this is the main argument for perdurantism, I conclude that we ought to reject perdurantism outright and accept endurantism.

Section 5: The incompatibility of B-theory and endurantism

So far then, I have argued that we must reject perdurantism in favour of endurantism. This alone does not give us a further reason to reject the B-theory. But this reason is supplied by the claim that the B-theory is incompatible with endurantism. I now argue for this claim.

To see why this is, first note that in order to adopt an endurantist view, one must conceieve of an object existing identically over time. This means that one and the same object literally exists at different points along the timeline. As mentioned, this applied to experiencing beings just as much as it applies to ordinary objects such as tables and chairs. Now, for the time being, let us put the problem of temporary intrinsics to one side and consider how we ordinarily think about experiential properties. We ordinarily think about them as being themselves intrinsic. For example, I am currently experiencing a computer in front of me, and this would ordinarily be considered an intrinsic property of me. And having this intrinsic experiential property is just as incompatible with having a different intrinsic experiential property as being bent and being straight are. I cannot have two sets of

experiences going on within my consicousness - there must be one, or the other. Suppose, for example, that O is looking at a blue wall, so blueness fills O's vision. Then suppose he turns and looks at a red wall, so redness fills O's vision. What we get here is what we might call the problem of temporary experiential intrinsic properties:

The Problem of temporary experiential intrinsic properties

1. O at t is identical with O at t*.
2. O is having a pure blue experience at t.
3. O is having a pure red experience at t*.
4. If, for every experience F, O at t has an experience of F, iff O at t* has an experience of F, then O at t is identical to O with O at t*. [Indiscernibility of Identicals]
5. O at t is having a pure blue experience and a pure red experience.

As should now be clear, there are two solutions to this problem. One is to adopt the endurantist view that, in fact, having an experience is merely a relation between an object and a time. The other is to adopt a perdurantist view according to which there are in fact two experiencers involved in the above description having two distinct experiences. However, I have argued that perdurantist view should be rejected and the endurantist view accepted. So, let us work through the consequences of this endurantist view. The consequence is that an experience is had by each of us when we are related to a particular time. So, right now I am having the experience of a computer in front of me because I am related to the current time in which I am sat in front of the computer. If O looks at a blue wall at t, then he is related to t and so has

a pure blue experience. If O then turns to look at a red wall at t*, he then becomes related to t* and has a pure red experience. That is, to have a particular experience is to be related to a particular time in which the experience takes place.

But now, ask: can the B-theoriest make sense of this endurantist view? I do not think they can. To see why note that the above solution only works with regards to our experiences if we can make sense of the idea that there is some *priviliged* moment of time that we are related to. If we are related to each moment of time that we exist at in just the same way, then this view would still entail that we would be having multiple experiential states. That is, it is only if we can suppose that we are *first* related to one time, and *then* related to another, and so on, that we can make sense of the idea that one and only one experience occurs within our consciousness. If we exist identically over time, and have different changing experiences, and are never to be subject to two incompatible experiences, as is required by endurantism, then there must be some sense that our relations to different times changes. And this sense can *only* be provided by the A-theory. According to the B-theory, we bear relations to times *tenselessly*. So, right now it would be true that O bears a certain relation to t sufficient to give rise to a blue experience, and a certain relation to t* sufficient to give rise to a blue experience. And so, if the B-theory is true, even if it adopts the relational account of intrinsic properties, it must *still* say that O has both a blue and a red experience going on. And so, for this reason, I conclude that the B-theory is incompatible with the endurantist solution to the problem of temporary intrinsics, and with enduratism itself.

Conclusion

In this chapter I have argued that endurantism should be accepted, and that the B-theory is incompatible with it, and so should be rejected. Combined with the conclusion of the last chapter, that the B-theory cannot account for the flow of time, this gives us a very strong reason indeed to reject the B-theory outright. In fact, it should now be clear that the last chapter and this one were interlinked. The primary reason why the B-theory fails is that it fails to account for the fact that we experiencing agents that persist identically over time, and have a flow of experience that changes as we do so. The A-theory, by contrast, can explain this. They can account for our existence of time in terms of endurantism, and explain how we, as experiencing agents, undergo changes in our experiences. It is the flow of time itself that brings us into relations with different times, one after another, and gives rise to our rich constantly changing experiential lives.

Chapter 4

Against the Moving Spotlight View

Introduction

In the last two chapters, I have demonstrated the flaws in the B-theory when applied to the flow of time and persistence over time. I have therefore overthrown the view that the B-theory alone can explain time. In chapter 1 I rejected one version of the A-theory, namely presentism. But this leaves two A-theory views still standing, namely the moving spotlight view and the growing block view. In this chapter, I will take a close look at the moving spotlight theory which has the roots in both the A-theory and the ontological view endorsed by B-theorists, viz. eternalism. I start in section 1 with an outline of the traditional version of the moving spotlight view. In sections 2-4 I consider objections that have traditionally been against the view, but argue that it can overcome all of these. This will prove important in the next chapter, because these objections, if successful, also apply to the growing block view. So by showing they fail in the context of the moving spotlight view I will also show they fail against the growing block view. In section 5 I then turn to an objection that I think does show that the moving spotlight view is false, namely the fact that it cannot account for an alethically open future, and so the possibility of free will. On the basis of this objection, then, I will reject the moving spotlight view.

Section 1: The Moving Spotlight View Outlined

The moving spotlight view consists of two parts of reasoning, on the one hand, it accepts the eternalist view that all temporal positions, both in the past and the future,

are as real as the present, and are arranged by the relations of ‘earlier than...’, and ‘later than...’, which means that there are eternally fixed B-relations between each of these positions; on the other hand, it acknowledges the privilege of the present, that is to say, it grants that the dynamics of time is an essential feature of time, as claimed by the A-theorist, which means that there is still a dynamical temporal point of present forever moving through time.

With the basic notion of this view explained, the advocate argues that the primary reason for the moving spotlight view to be considered as a legitimate theory of time, by taking this approach our sensation of the temporal passage can be explained in a transparent way, for the fact that it avoids the issue the B-Theorist faces that our perception over time’s flow cannot be explained if all the temporal relations are eternally fixed (i.e. as argued in the last two chapters). To be more specific, according to Curtis & Robson (2016: 69), although this view does not mean that the temporal flow is literally true, it accepts that there is this constant dynamics, which is very close to the concept of time’s flow being literally true, and explains why we find these metaphors apt. What the moving spotlight means in terms of time’s flow is that by granting the privilege to the present moment, it indicates an objective distinction between the dynamical present, the past, and future, and therefore it can justify the idea that the present moves through a B-series of moments. The “now”, as it were, moves along the timeline from the past into the future, with successive moments becoming the present.

However, as above-mentioned, we should be careful to note that the term ‘moving’ should not be understood in a literal sense. It is not as if there is any object, or thing, moving along the timeline. Instead, they can understand the present as ‘moving’ in the following way:

> [T]he present ‘moves’ along the B-series in virtue of successive B-series moments gaining, and then losing, the property of being present. (Curtis & Robson, 2016: 69)

To illustrate, we can imagine a line of light-bulbs that get turned on then off one after the other. In this scenario there is actually nothing that moves along the light-bulbs, but the fact that each light-bulb gains and then loses the property of lighting up in order does show that there is dynamics of the properties that constantly takes place along the line. By applying this dynamic feature to the moving spotlight case, it is quite explicit that the privileged present, like each light-bulb’s gaining and losing the property of lighting up, is gained and lost by every moment in the B-series, in which there is a constant shifting of the present’s temporal location, like the movement of a spotlight. Therefore, the advocate of the moving spotlight theory can embrace the view that time does have a genuine ‘flow’ to it.

With this understanding of the moving spotlight view in place, then, I now turn to objections. As mentioned, the first three covered in sections 2-4 can be answered by the moving spotlight theorist. Also, as mentioned, this will be important, because if these objections were to succeed, they would also succeed against the growing block view, which I will defend in the next chapter.

Section 2: The First Objection - Hypertime

The first objection can be stated as follows: if time consists of all the moments in the past, the present and the future, then naturally, one must ask how it possible for

change to occur along the moments? The basic trouble here is that, it seems, changes are things that occur *in* time, and so cannot occur *to* time itself, unless another dimension of time is posited in which the changes in the first dimension (i.e. the timeline itself) happen. This is to posit what is called 'hypertime'. As Curtis and Robson put this point:

> [I]f there are to be changes with regards to which B-series moment is the present moment, then there must be a second-order time series of 'hypertimes' relative to which these changes occur. (Curtis & Robson, 2016: 70)

To be more specific, as above-stated, the present *moves along* the moments of the B-series so that there is a constant change that appears in time, and for this reason it is seems we must say that such change takes time to happen. And so, then it it seems we must assume further that there is supposed to be a second-order time series of 'hypertimes' regarding which moments are present.

This seems strange enough. But Broad (1938: 277-279), when he discusses this point, goes even further. He argues that if this second-order dimension of hypertime is to be thought of as a genuine time across which changes happen, then it must be that for changes to occur across it, there must in fact be a third-order time series of hypertimes, and if there is a third-order time series, then there must be a fourth-order time series, and so on. Obviously, as this generalises, this hierarchy of time series turns out to be infinite. And this, it seems, is very strange indeed, and highly counterintuitive.

However, despite the fact that Broad himself thought this objection was fatal to the moving spotlight view, it is not so clear that it is. The approach is clearly not ontologically parsimonious, but many metaphysicians claim that it is not clear why such hierarchy of time series is considered as problematic. According to Curtis and Robson (2016: 71), it is not clear why defenders of the moving spotlight view can't simply accept this consequence of their view, despite it being counterintuitive. As stated above, some argue that there could be an infinite hierarchy of hypertimes for each moment, and there could also be hyper-hypertimes and hyper-hyper-hypertimes, so on and so forth to an endless extent. Despite that this hierarchy does not seem to be ontologically parsimonious, some argue that it is unclear why this should be a major issue for the moving spotlight theorist to deal with. More precisely, there is an argument to justify the infinite hierarchy in this moving spotlight scenario, by appealing to the Platonist view on objects and their properties.

According to the Platonist view, there are two essential features as to how the physical objects possess properties, one is that 'objects possess properties in virtue of standing in relation to Platonic universals, viz. immutable and transcendent entities.' (Curtis & Robson, 2016: 71) For instance, all my leather jackets are black, so it is a Platonic fact that my jackets possess the property of being black in virtue of standing in the relation to the Platonic universal of being black. The other feature is that, just like objects, Platonic universals have properties as well. If this is the case, then there are second-order universals, which entails the existence of third-order universals, which leads to fourth-order universals, to an endless extent. As discussed by Curtis and Robson (2016: 71), the Platonists accept that there are infinite hierarchies of properties possessed objects and of universals, and do not seem to be worried about the commitment to such an infinite hierarchy of universals. In short

words, the Platonists believe that an infinite hierarchy of universals is the 'metaphysical structure of reality' (Curtis and Robson, 2016: 71)

By applying this strategy to the moving spotlight scenario, it looks like the moving spotlight has now discovered a solution to overcome the hypertime objection by claiming that an infinite hierarchy of hypertimes is actually the *metaphysical structure of reality*. Furthermore, the moving spotlight proponents, such as George Schlesinger (1980), takes this reply to the hypertimes objection even further, and questions its legitimacy as an objection by claiming that, according to Schlesinger (1980: 32), first-order times suffice to explain change in terms of their second-order temporal locations and second-order times suffice to explain change in terms of their first-order temporal locations, and that it is not necessary to include the third-order time series in the mix to justify the moving spotlight ontology. If this is so, then defenders of the moving spotlight view can avoid a committment to an infinite heirarchy of hypertimes, and accept just two levels of time, ordinary time and hypertime. This, it seems, is not too much to swallow, and so makes the claim that this is just how the metaphysical structure of reality is seem more plausible.

Furthermore, some moving spotlight proponents claim that there is another argument that has newly become an option for developing Schelsingers view, that is, primitive tense operators. As discussed in the previous chapters, primitive tense operators are first invented by Prior (1967) in order to restrict tense operators in a proposition. According to Prior (1967: 8 - 10), there are three different tense operators, past-tense, present-tense, and future tense; and among these operators, 'primitive' represents that these three operators are the primary ones, and restricts that these operators cannot be explained any further. By applying primitive tense operators to the moving spotlight view ontology, it may be able to restrain the

commitment to only first-order moments by claiming that flow of time is simply a *primitive* change in the tenses possessed by first order moments (i.e. they can say this is what a so-called 'hypertime' is). At any rate, it seems clear that this objection to the moving spotlight view can be met by the defender of the view and causes no significant problems.

Section 3: The Second Objection - The Rate of Passage Objection

The second objection usually comes hand in hand with the first one. If we consider the possibility of hypertimes, what is not clear is that if the temporal change constantly moves along the moments of the B-series like a metaphorical spotlight, then such a flow must be constantly in motion at a certain rate or speed, and we can therefore ask: at what rate or speed does the spotlight move along the B-series moments of time? And to this, it seems at first, the moving spotlight theorist has no adequate answer.

In other words, it seems to be absurd to ask how fast time passes, for this appears to ask for 'a rate of change in terms of units of first-order time and units of second-order time.' (Curtis & Robson, 2016: 72) What appears absurd about this is that there is no way to actually know the rate of change in terms of units of first-second time and units of second-order time without a certain measurement or comparison. Therefore, in response to this objection, Markosian (1993: 843) argues that the term *change* in this question appears to be rather ambiguous, for there is no restriction on the comparison between two temporal changes. To be more specific, when one describes an event, say, that there is a car that is moving at 30 miles per hour. In this event, a car endures a change in the spatial location of 30 miles while a

moment endures a change in the temporal location of an hour. Based on this description of the event, the comparison is restricted between a spatial change and a temporal change, therefore one can have a comprehensible outcome of the comparison. However, it is a different story comparing a change in time with a change in time, for there is not any measurement one can adopt in order to conduct such a comparison. Thus, it seems it makes no sense to ask 'how fast does time pass?', i.e. it seems it is not a legitimate question.

Regarding the passage rate of time, Maudlin, however, takes a different approach. Since the only temporal measurement known to human beings is the hierarchy of hours, minutes, seconds and milliseconds etc., the question of how fast time passes stands for itself, and it is in fact about how things change temporally over a period of time, therefore the answer is simply that time passes 'at the rate of one hour, or one second per second, or 3,600 seconds per hour.' (Maudlin, 2007; 112) Maudlin thus suggests that the question is in fact a legitimate one, makes perfect sense, but has a trivial answer. He says that the answer is, in fact, a necessary a priori truth, and so should cause the moving spotlight theorist no difficulty whatsoever. I have to say that, in this regard, Maudlin's answer seems to me to be spot on, and so we again find that this objection causes no difficulties to the moving spotlight theorist.

Section 4: The Third Objection - the McTaggart Argument

As for the third objection, I intend to go through the McTaggartian argument against the existence of an A-series. As mentioned in previous chapters, McTaggart introduces the concepts of the A-series and the B-series in his 1908 paper '*The*

Unreality of Time', and attempts to reject the idea that time exists. The tactic adopted by McTaggart is to show the fundamentality of the A-series in constituting time first, and following this demonstration McTaggart points out the impossibility of time being arranged according to an A-series, which, if correct, would disprove all A-theory views, and therefore the existence of time. McTaggart's begins spelling out his argument as follows:

> Past, present, and future are incompatible determinations. Every event must be one or the other, but no event can be more than one, If I say that any event is past, that implies that it is neither present nor future, and so with the others. This is essential to the meaning of the terms.... But every event has them all. If M is past, it has been present and future. If it is future, it will present and past. If it is present, it has been future and will be past. Thus all the three characteristics belong to each event. How is this consistent with their being incompatible? (McTaggart, 1908: 468)

As stated by McTaggart, it is impossible for a temporal event to have all three different A-properties of being past, being present and being future. But, according to him, each event does have each of these properties. In response to this assertion, the A- theorist might balk, and argues that this is not quite true, because every temporal event has these properties *successively*, and not at once. Therefore, they might claim, McTaggart seems confused about M's temporality, as M is not past, present and future at the same time, but *successively*. However, McTaggart insists that there is by no means a mistake in this claim, and goes on to argue:

> But his explanation involves a vicious circle. For it assumes the existence of time in order to account for the way in which moments are past, present and future. Time then must be pre-supposed to account for the A series. But we have already seen that the A series has to be assumed in order to account for time. Accordingly the A series has to be pre-supposed in order to account for the A series. And this is clearly a vicious circle. (McTaggart, 1908: 468)

Clearly, what McTaggart has in mind is to address the problems that he thinks are caused by the pre-supposed temporal premise of the A-theory view. To be more specific, it is the existence of tense that is in question, but the A-theorist adopts the assumption that tense exists in order to explain how events in time can have the A-properties of past, present and future. When asked as to the existence of tense, the A-theorist answers that the A-properties of past, present and future are had successively by events, which just means (with regard to a present event for example) that it *was* future, *is* present, and *will be* past. But this *uses* tensed notions and so is just to assume that we have *already* explained the existence of tense. This is McTaggart's famous argument against the possibility of there being an A-series, and so against any A-theory of time, including the moving spotlight view (and, as mentioned, the growing block view too). As it is notoriously difficult to understand, it will be worthwhile spending a little more time spelling it out.

Above it is fairly clear what McTaggart means when he calls the attempt to explain tense circular. But he also says it leads to vicious regress. Why does he say this? McTaggart argues that since an event is past, and was future and present, therefore, it is inconsistent to say something that has all three temporal properties simultaneously. As stated above, the A-theoretical response to this assertion is that a

temporal event has these different temporal properties successively, so there is no issue here. McTaggart obviously does not agree with this, and argues that:

> If we avoid the incompatibility of the three characteristics by asserting that M is present, has been future, and will be past, we are constructing a second A series, within which the first falls, in the same way in which events fall within the first..... the second A series will suffer from the same difficulty as the first, which can only be removed by placing it inside a third A series. (McTaggart, 1908: 469)

The intention behind this statement is to show that there can be infinite number of *sub-moments* for every moment. For example, the present moment can be divided into the *now-now* moment, and the *now-past* moment, etc., thus, if there are countless components to form a moment, then there is a vicious regress.

However, the moving spotlight theorist has an answer to this. In order to see what it is I now turn to consider Ross Cameron's recent development of the moving spotlight view in his (2005). McTaggart acknowledges the key point that McTaggart thinks that any attempt to define an A-series is '...circular, and it leads to vicious regress.' (Cameron, 2015: 53) But, Cameron admits, the scenario McTaggart draws about the infinite regress of A-series is not wrong. The A-theorist can accept the idea that there can be infinitely many sub-instants to form a moment, but can deny that that this is a vicious regress. According to Cameron (2015: 60), there is no problem with McTaggart's claim that there is an *infinite* regress caused by the A-series, yet, what it is to be further discussed is the claim that it is a *vicious* regress. For Cameron, McTaggart seems to be confused as to the distinction between two

different kinds of regresses, and therefore to mistakenly think that it is a vicious regress. The two kinds of regresses Cameron addresses are *benign regress of explanation* and *vicious regress of explanation*, respectively.

The former states that:

> At each stage, n, an instance of a puzzle is posed and explanation offered, and this explanation gives rise to a new instance of the puzzle, forming stage n+1; but the success of the explanation at stage n does not depend on the puzzle at stage n+1 being resolved. (Cameron, 2015: 60)

Whilst the latter suggests that:

> At each stage, n, an instance of a puzzle is posed and an explanation offered, and this explanation gives rise to a new instance of the puzzle, forming stage n+1; and furthermore, the success of the explanation at stage n depends on the puzzle at stage n+1 being resolved. (Cameron, 2015: 60)

The difference between the two kinds is that the concept of benign regress indicates that the physical world consists of an endless number of puzzles, and each puzzle's being solved leads to the next puzzle, while that of vicious regress denies the possibility of a puzzle being solved. To apply this statement to the A-theoretical argument, Cameron argues that McTaggart has given us no reason to think that the infinite number of sub-instants of a moment in A-series fits in the category of a vicious regress rather than a benign one.

I agree with Cameron's diagnosis of McTaggart's argument, and so agree that it poses no problems for the moving spotlight view (or any other A-theory view, including the growing block view). Before I finish this section, however, I spend a little more time outlining Cameron's own version of the moving spotlight view. For he goes on to develop a version that he thinks is more plausible than any version developed before.

According to the modified moving spotlight view, reality is considered as a spatiotemporal manifold, and in such manifold, all temporal events and objects are arranged in permanently fixed temporal relations. Furthermore, as Deasy nicely summarises, 'moments of time are identified with maximal three-dimensional slices of the manifold.' (Deasy, 2016: 2) Now with the basic theoretical structure established, Cameron (2015) carries on to state that another key feature of this version is the appeal to the notion of distributional properties primarily advanced by Josh Parsons (2004), and according to the concept, properties of this sort have a feature of cross-time quality. Accordingly, Cameron argues that every object that exists in permanently fixed temporal relations has one of those *temporary distributional properties* throughout time. Moreover, Cameron believes that not only such are fundamental properties for objects to have, but also they can ensure the changes that happen in the fundamental properties of objects through time.

When applying to the notion of these properties to the view, it allows non-present objects to exist at present by granting them this type of fundamental properties. For example, Socrates and the first human to travel to Mars both exist at present in this spatiotemporal manifold. To be more specific, Socrates has this distributional property of teaching philosophy to his pupils thousands of years ago and now being dead; similarly, the first human to visit Mars has a distributional

property of not existing on earth now and of visiting Mars at some point the future. That is to say, every state of affairs an object has ever instantiated throughout time is temporary. For example, Socrates's teaching students, and later in time drinking poison, and now being dead are all temporary parts of a fundamental temporary distributional property that he has.

Among all the merits Cameron believes this version of the moving spotlight has, there are two important advantages that are worth a few words. The first advantage is that this view does not have to take tensed facts as necessarily fundamental. To be more specific, there are two possible ways to understand this statement, one way is to understand this in the sense that there are no such thing as fundamental temporary truths. But this seems instantly problematic, as the proposition that here I am existing and typing words on the keyboard shows that this state of affairs of me temporarily doing things does exist, which Cameron actually acknowledges. Therefore, it certainly does not seem sensible to understand the statement this way. The other way to comprehend it is to take it in the sense that 'Cameron is not committed to the fundamentality of temporal operators like 'it was the case that'' (Daesy, 2016: 4) However, this path seems equally troublesome as the first, as it contradicts with Cameron's own theory. For the alternative to primitive temporal operators are the primitive joint-carving concepts, but Cameron believes that such alternative should be rejected, and also he makes it clear that any views that associate with primitive joint-carving concepts should be rejected. Until the point where Cameron offers a proper explanation for this first virtue, it remains an issue for this modified version of the moving spotlight view.

The second virtue Cameron thinks his view has over the traditional version is

that, by endorsing this modified version, one does not have to 'take [presentness] as a primitive feature of reality that some time is present.' (Cameron, 2015: 151) To be more detailed about this claim, in Cameron's argument, the truthmaker for the proposition 'this time is present' is the fact that 'there is a state of affairs of everything's being such that the age it has at this time is just its age simpliciter.' (Daesy, 2016: 5) Although this aspect enables the moving spotlight view to avoid commitment to present's primitive feature of reality, it remains unclear whether this is actually an advantage only with Cameron's approach, because both Phillip Bricker (2006) and Daniel Daesy (2016) both offer a version of the moving spotlight of their own, what they all share in common is that there is a spatiotemporal manifold as the basic foundation for their theoretical models.

At any rate, as should be clear, it is rather unclear whether Cameron's development of the moving spotlight has any real advantage over the traditional version. Nonetheless, this shall not matter in what follows, because I think there is an objection to the traditional view that applies equally as strongly to Cameron's. It is to that objection that I now turn.

Section 5: The Fourth Objection - The Open Future and Free Will

In this section, I will argue that despite all the efforts (some are ontologically strong) from the advocates of the moving spotlight views discussed above, this view is not able to provide a satisfactory explanation about the open future. The general view of the moving spotlight in a nutshell is that the past, present, and future are all real, and we, at the the so-called present, are only going through times that already exist. But I

think, metaphysically and intuitively, this is not an acceptable explanation for it cannot account for the open future, and so cannot allow that we possess free will.

To begin, I should define what I means when I say that the future is open. I should do this because there are a great many different meanings that this term may have. First, it may mean merely that the future is epistemically open, i.e. that we cannot *know* what the future will hold. I do not mean it in this sense. Second, it might mean that it is *causally* open, i.e. that our current actions cannot have an effect on the future. I do not mean it in this sense either. But third, it might mean that the future is *alethically* open. And it is this sense that I do mean it. This sense was first outlined by Aristotle in a famous passage in De Interpretatione, as follows:

> A sea-fight must either take place to-morrow or not, but it is not necessary that it should take place tomorrow, neither is it necessary that it should not take place, yet it is necessary that it either should or should not take place tomorrow […] One may indeed be more likely to be true than the other, but it cannot be either actually true or actually false. (Aristotle 2006: 33)

As I understand the notion, I will take alethic openness to be:

> The future is alethically open iff for all propositions p, p is not true now and p is not false now. (See Markosian, 1995: 96)

According to any eternalist view, of which the moving spotlight is one, the future is not alethically open, but closed. That is to say, even though we cannot now know what the future will hold (i.e. it is epistemically open) and even though our actions

now can have a causal influence on the future (i.e. it is causally open), there is still a currently existing fact of the matter, for each proposition p about the future, whether that proposition is true or false. This is true because the future already exists. It is "out there", as it were, in reality. As the moving spotlight moves along the timeline, it merely passes along the times that are already there. As such, the future, just like the past, is fixed, according to the moving spotlight view.

It is worth reflecting upon how odd this view is. It entails that all future truths are just like all past truths. Just as there is absolutely nothing we can do to change the fact that World War II happened, because it exists in the timeline, there is likewise absolutely nothing we can do to alter the fact (if it is a fact) that World War III will happen in fifty years, because it exists in the timeline in just the same way. It is granted that our actions can have a causal impact on the future, unlike the past, but this does not change the fact that if an event is out there on the timeline already, it *will* happen. That is, it is not that it *might* happen, but if we try hard to stop it, it might not. No, it *will*, with 100% certainty happen, if it is out there already on the timeline. That means no matter what we try to do to alter the fact, and however we exert our causal powers to effect the future, all out efforts will invariably lead to the events that are already out there on the timeline.

The problem with the above view is fairly clear. It means that, in an important sense, our free will is limited. To see how the argument for this claim goes, consider that it is now true (because the event already exists on the timeline) that World War III will happen in fifty years time. Now consider:

Freedom Argument

1. It is presently true that WWIII will happen in fifty years time.

2. If it is presently true that WWIII will happen in fifty years time, then we are not free to prevent WWIII from happening.

3.If we are not free to prevent WWIII from happening, then our free will is severely limited.

C. Our free will is severely limited.

One might balk at this argument, and claim that our free will is not severely limited by the mere fact that we cannot prevent one event from occuring. But note that this event was abitrarily chosen, and the same line of reasoning applies to every proposition regarding what will happen in the future, including ones about our own actions. For example, I could have run the same argument supposing it to be true that I will get married in a year's time, or that I will become a plumber, or that I will die before I finish my thesis. If we take the set S of all true propositions about what will happen in the future, we have:

Freedom Argument 2

1. S contains all propositions about what will happen in the future.

2. All the propositions in S about will happen in the future are presently true.

3. If all the propositions in S are presently true, then we are not free to prevent any of the events mentioned in S from happening.

4. If we are not free to prevent any of the events within S from happening, our free will is severely limited.

C. Our free will is severely limited.

Now, there are some who are happy to admit that we do not have free will (e.g.

Strawson (1986) and Pereboom (2001)). But as far as I am concerned, this is again such a fundamental tenet of our view of the world and our place within it that I think we are justified in rejecting a view that limits our freedom in this way. This is not to say that I have a positive account of what it is to have free will either. That is, I do not know how to lay down sufficient conditions for having free will. But, I do think I know that the ability to actualize more than one possible future for myself is a necessary condition. And, for this reason, because the moving spotlight view rules this out, I believe we must reject the view.

Conclusion

In this chapter I have considered the moving spotlight view and rejected it. I have argued, however, that it can answer some of the objections that have been levelled against it. But, I have argued, it must be rejected because there is one objection that tells against it. We must retain the possiblity of having free will, and because the moving spotlight view does not allow for this, I reject it. In the next chapter I turn to the final metaphysical view of time, the growing block view.

Chapter 5

For the Growing Block View

Introduction

At this point, I have discussed three metaphysical views in order to find a theory that can explain time and temporality, namely, presentism, B-theory eternalism, and the moving spotlight view. I have rejected them all. This leaves one view still standing, namely the growing block view. It is this view that I will discuss in this chapter. I will argue that it succeeds where all the others fails, and so that it is the view of time we should adopt.

In section 1 I outline the view and explain briefly why it is superior to all the others. Then in the following sections I go on to substantiate these claims in more detail. In section 2 I consider each objection to the other views and explain how it overcomes them. Then in section 3 I outline an objection that is thought to be a major one that faces the growing block view. In section 4 I consider a reply to that objection due to Peter Forrest and endorse it. Finally in section 5 I consider an alternative development of the growing block view due to Michael Tooley, and explain why, although I accept the growing block view, I reject his version of it. I thus conclude this chapter by endorsing the growing block view outright.

Section 1: Outline of the Growing Block View

According to the growing block view, both the past and the present are real while the future only comes into existence by becoming the present, before then receding into the past as new presents come into existence. That is to say, this view partly accepts

the eternalist view, but only with regard to the past, while it clearly grants the idea that there is no future and a constant temporal dynamic, which is endorsed by the presentist. It is thus a kind of midway position between the two. According to some this means it inherits the problems of each of those two views. But, in my view, it actually inherets the strengths of each. Firstly, as we will see, it can adequately solve the Truthmaker objection unlike presentism. Secondly, it can explain the flow of time, unlike B-theory eternalism. And thirdly, it can account for the open future, unlike the moving spotlight view. In addition, it has no insurmountable problems of its own. And thus, I believe it is by far the most superior view of time and should be adopted. I elaborate on all of this in the remainder of this chapter. But before I get to this, I first frame the growing block view more fully by briefly consider the history of it.

The growing block view has undergone some development since it was first defended in the 1920s, but charting its development will prove useful to us in what follows. According to some, the original and basic notion of the growing block view in fact derives from the work of Samuel Alexander (1920), who is credited with first mentioning the basic notion of this view in his book '*Space, Time, and Deity*'. It is worth pausing over this claim to assess its truth.

Alexander (1920: 61) claims that since there is *diversity* in the physical world, there must be a co-existent relation between space and time, for, he says, there will not be *diversity* in substance without space or time. To be more specific, he says if there is no space, time will solely be a simple '*now*' that takes place on repeat, which provides absolutely no room for the existence of substantial diversity. Following this line of reasoning, he says this entails that space must be created *by* or *in* time because there is no dynamics in space alone either, and time is the source that provides movement. This is taken to be expressing the basic idea of the growing

block due to the notion that space is *created* in time, suggesting that space comes into existence as time flows. We shall certainly have reason to consider this particular aspect of the growing block view, and it is right to say that this does express a committment of a defender of the view. But despite this, it is in fact clear that Alexander himself did not endorse the growing block view. To see this, consider that he goes on to say:

> Space-Time thus consists of what may be called lines of advance connected into a whole or system.... In the line of advance c b a we have the displacement of the present from c through b to a, so that a becomes present while b comes past and c still further past..... The present means as before the point of reference. In terms of earlier and later, b having been later and c earlier, a becomes later and cb earlier. Now this is the meaning of motion. Points do not of course move in the system of points, but they change their time-coefficient. What we ordinary call motion of a body is the occupation by that body of points which successively become present..... Thus Space-Time is a system of motions..... a single vast entity Motion. (Alexander, 1920: 61-62)

According to this statement, it seems that although Alexander supports the view that time is dynamic, i.e. the A-theory, his description of motions as lines of advance, and Space-Time as a system of points in which the points occupied by a body continuously turn into the present, suggests he holds an eternalist ontology. Therefore, despite sometimes being credited as being the originator of the growing block view, it is clear that the metaphysical view he has in mind is rather the moving spotlight theory than the growing block view.

With this established, I turn to a discussion of its actual first supporter C.D. Broad, who had previously been an eternalist but claims in his 1923 book *Scientific Thought* that he adopts a new theory that:

> [A]ccepts the reality of the present and the past, but holds that the future is simply nothing at all. (1923: 66)

If the future is not real, he says, then it is a state of nothingness. However, from nothingness it comes into existence by *becoming* the present, therefore temporal becoming is the key notion in the position that Broad builds. He holds that temporal becoming happens constantly as nonexistent moments come into being as the present. Of all the temporal theories examined in this dissertation, this in fact seems to me to be the most intuitive one so far. Because, on the one hand, most of us humans, if not all, are intuitively willing to believe that time is real, which somehow grants certain profound meanings to each of our lives. But more than this, as mentioned in the last chapter, we view the past as being fixed, and impossible to change, but the future as being open, liably to be shaped by the present, but not yet in existence.

On the other hand, We also instinctively believe that each and every one of us has free will, and so that we are the ones that determine the content of our lives based on possibilities. If the growing block view is true, then it would prove that our intuition regarding of the physical world is accurate. However, this is also exactly where some theorists see the problem with this view lies. Broad recognises all of these advantages, and it is in large part the reason why he accepts it. I elaborate on this advantage in the next section, where I also consider how the view overcomes other objections that have been raised in this thesis so far to other views.

Section 2: How the Growing Block View Solves the Problems Other Views Cannot

In this section I consider the problems that have so far beset the other views of time I have considered, and show that the growing block view overcomes them all.

The Truthmaker Objection

Firstly, remember that according to the Truthmaker objection to presentism, every true sentence must have a truthmaker, i.e.:

> Truthmaker Principle: For every true sentence, there must be a state of affairs existing in the world that necessitates and/or grounds its truth.

When we considered presentism, the main example sentence we considered was:

> Past tense dinosaur sentence: Larry the dinosaur did exist.

The problem for presntists was that the admitted this sentence is true, but because they do not believe the past exists, could not adequately account for its truth by providing a truthmaker for it. Now, clearly, the growing block does not face a problem in this regard. As defenders of the view think the past exists, they can say, just as the eternalist does, that this sentence is made true by the existence of Larry the dinosaur himself at those past times.

However, we focussed on past-tense sentences when looking at presentism, but also noted that the objection applies to future-tense sentences too. So, for exampe, consider:

Future tense Mars sentence: There will be humans living on Mars.

Of course, we do not know whether this sentence is true or false, because we cannot know what the future will hold. But, according to some, it is now either true or false, and so still requires a truthmaker if it is true. The growing block view cannot account for this, and so there is a version of the truthmaker objection that applies to the view. However, it is not a serious objection, because in the case of the future it is very plausible to deny that such sentences are either true or false now. As discussed in the previous chapter, in fact, I think we we should accept that the future is alethically open. And if this is right, then the future tensed Mars sentence is not now true and not now false. And as such, it needs no truthmaker. So, although the presentist must provide a truthmaker for past tense sentences, and this refutes their view, growing block theoriests have no need at all to provide truthmakers for future tensed sentences, and so there is no truthmaker objection to their view.

The Flow of Time and Persistence over Time

In chapters 2 and 3 I rejected the B-theory on the basis of the fact it cannot account for the flow of time and our experience of that flow, and relatedly, it cannot account of the the fact that we endure over time by existing literally identically at different times. The growing block view is an A-theory view and so can account for these things. But, it is worth saying just a few words about how.

On the growing block view the flow of time is constituted by the coming into existence of states of affairs at the edge of the growing block, i.e. at the edge of what exists. It is therefore plausible to think of the coming into existence of states of affairs at that point as what *makes* that moment priviliged as the present moment. When we considered endurantism, I said that the B-theory cannot account for the fact that we have one and only one experience and suggested we do so due to the fact that we bear a relationship to only one moment of time that keeps changing, giving rise to a succession of experiences, as we become related to different moments of time. On the growing block view this is captured by the idea that we bear a special privileged relation to the moment of time at the edge of the block. As such, defenders of the growing block can explain not only the flow of time in terms of the growing of the block, but also our experience of that flow. We bear a special relationship to the moment that is at the edge of the block, which gives rise to experiences within us, and they constantly shift as time flows because we constantly become specially related to a new moment, i.e. the one that has just now come into existence. This, in fact, as we will see, will be important in what follows. But for now, the point is that the growing block theory can perfecfly well account for the flow of time, our temporal experiences, and how we endure over time.

The Open Future Objection

As we saw in the previous chapter, the moving spotlight view cannot account for the open future, and so cannot allow for the possibility that we have free will. I argued there that this is a sufficient reason for rejecting the moving spotlight view. The moving spotlight view faces this problem because of its committment to eternalism

and so the view that the future exists. However, as already mentioned above, the growing block view faces no such problem. On the growing block view the future does not yet exist, so they can perfectly well allow that it is alethically open, i.e. that sentences about the future are not now true or false, but only become true of false when the future comes into existence. This, at least, gives us the possibility of having free will. Even if we cannot yet give a full account of what our free will consists in, we can be be certain that such an account is possible. And so, the growing block view overcomes the problem that the moving spotlight view faces too.

So, the growing block view is superior in these respects to each of the views we have so far considered. However, it does face a problem of its own, to which I now turn.

Section 3: The "How Do We Know It Is Now Now?" Problem

So, from the above it is clear that the growing block view can solve each of the problems the other views faced. But, this does not by itself mean that it should be adopted, because it may well face its own insurmountable problems. So, in what follows, I consider whether it does so, and argue that it does not.

In fact, many of the problems raised for the growing block view have already been considered, such as the hypertime objection and the rate objection. However, Broad (1938: 280-281) himself does not think that these two objections, which have also been raised against the moving spotlight view, can cause any substantial issues for the growing block view, which we have already considered in the previous chapter. But, as we have seen, those objections can be met by the moving spotlight theorist, and they pose no extra problem for the growing block view. That is, the

growing block view can simply adopt the solutions to them that the moving spotlight theorist adopts.

So, what we need to ask is: are there any problems that have been raised in particular for the growing block view? And, in fact, there is. This is the “How Do We Know It Is Now Now?” problem.

This problem has been raised in various forms by both Bourne (2002) and Braddon-Mitchell (2004). More specifically speaking, both theorists argue that if the growing block view is true there should be a match between the mental now and the actual present now. The strategy applied in this objection is to first set up the claim that we should experience the actual present moment, i.e. our conscious experiences should be of the moment at the edge of the growing block. With this claim being set up, Braddon-Mitchell then goes further to argue that since past people still exist in the past (i.e. in the back of the block) then they will still be having conscious experiences where they are located. And because of this, he argues, we cannot know on the basis of the fact that we are having conscious experiences that we do indeed exist in the present moment at the edge of the block rather than in the past in the back of the block.

To go further here, Braddon-Mitchell argues that if this is the case, then it entails that every experiencing being in the past can perceive the present moment *of their time*. For instance, according to the four-dimensional view, Robin Hood in the past is still real, and for this reason, Robin Hood firmly believes that he is *now* robbing the rich and saving the poor. Furthermore, I also have this firm belief that I am now typing at my keyboard, thus, obviously, both Robin Hood and I believe that we are in the present time, respectively. The necessity to demand a distinction between Robin Hood’s belief and my belief is where Braddon-Mitchell’s argument

strikes, for there is no way to differentiate Robin Hood's belief from my belief in terms of being present. He then concludes that just as Robin Hood believes he is present, but is not, I may well believe that I am present even thought I am not. And so concludes that there is no way for anyone to know that they are 'now' (understood indexically) in the genuine 'now' (understood as picking out the edge of the block). And this undercuts our reason for believing in the growing block view in the first place.

This then is currently considered to be the major problem that the growing block view faces. However, I do not believe it to be a major problem, or indeed any problem at all. In order to explain why I first draw upon an intuitive reply made by Forrest (2004).

Forrest says that both the past and Robin Hood are *dead*, that is, although Robin Hood exists in the back of the block, he is not having any experiences at all. Therefore, he says, there is no Robin Hood thinking that he is currently in the present moment, and this is what he calls 'the Past is Dead' hypothesis. This reply seems like an easy way out for the growing block theorist but the problem with this reply is obvious, since the growing block view suggests that the past is as real as the present, accordingly, why deny that things in the past, if they are real, are conscious?

Regarding this objection, Braddon-Mitchell comes up with a potential solution on his own but also claims that such solution requires a high ontological price. He says:

> Suppose that the hyperplane that is the objective present is the only one that contains consciousness...[and]... consciousness is some by-product of the

> causal frisson that takes place on the borders of being and non-being. (Braddon-Mitchell, 2004: 201)

By adopting this definition of consciousness, it does show that the objective present and the human consciousness of it can be successfully integrated with each other, and that being said, it then solves the “How Do We Know It Is Now Now?” objection, for if the consciousness is the by-product of the causal frisson that occurs constantly at present moment at the edge of the block, then there is no difference between the objective *now* and the subjective *now*.

However, Braddon-Mitchell (2004) rejects this solution as he believes that there will be too much of an ontological price that comes with this approach, as mentioned above. According to Braddon-Mitchell (2004: 202), to explain the simultaneity of the objective *now* and the subjective *now* in this fashion is to face a serious issue. His strategy to demonstrate this is to assume that there is an objective now and that he exists in it at first, and then to show that there is no way for him to know what else is in the same reality.

To be more specific, say I believe that I am in a dynamic temporal reality which I think is real and has an objective present that constantly moving towards the future, and that there are other physical beings that also exist in the same temporal reality, such as other humans and objects. However, if this should be the case, according to Braddon-Mitchell, I then have to explain which frame of reference the hyperplane of simultaneity depends on.

But, before I do that, it is necessary to briefly explain what the concept of the hyperplane of simultaneity is. The view that the theorists, such as C.D. Broad (1923) and Michael Tooley (1997) among others, support entails that the past does exist, whereas the future does not, and the present is regarded as the hyperplane that

expands the reality of being; moreover, simultaneity, in the discussion of physics, is considered as something that is not absolute, rather, it is something that depends on the observer's frame of reference. That being said, the hyperplane of simultaneity is the notion that describes the present in a relativistic sense.

Now back to the discussion of which frame of reference it is for the hyperfine of simultaneity to depend on, this relies upon a fact about one of our best physical theories, i.e. special relativity. According to that view, there are as many frames of reference as there are conscious beings, and for this reason I should not take the simultaneity of the present for granted, for it is necessary to clarify which frame of reference is preferred in order to determine whether the other physical and conscious beings are simultaneously existing with me in this temporal reality. Braddon-Mitchell takes advantage of this issue of uncertainty over frame of reference, and claims that since there is no way to know that every conscious individual experience the past or the present simultaneously, therefore it is impossible to know whether each of us is conscious of the same objective now.

Following this objection, Braddon-Mitchell goes further to argue, although without providing a detailed account over it, that there is another problem that the advocate of the growing block view should be concerned about, namely, how to understand the different meanings of the '*now*'s in the question '*how do we know that it is now now?*' According to Braddon-Mitchell (2004: 202), despite the fact the '*now*'s are both coherent, they should be understood differently: one *now* represents a metaphysical sense of the present time, while the other *now* is used solely as an indexical. Furthermore, the first *now*, which is understood in a metaphysical sense, is supported by the presentist; as for the other indexical *now*, its definition offers a clear explanation over '*how we know it is now 'now*". However, Braddon-Mitchell argues

that the growing block view inherits all the issues of both '*now*'s yet fails to obtain any advantages of both 'now's.

His sense of humour in calling the growing block view a 'growing salami' view apparently reveals that he is not the biggest advocate of such view, but such a sense of humour is unfortunately based on his misunderstanding over the growing block view, therefore, his conclusion that the growing block view has to pay a sky high ontological price is not true.

Section 4: Peter Forrest's Response to Braddon-Mitchell

In response to Braddon-Mitchell's objection and self-reply to it, Peter Forrest (2004) offers a different approach over how each *now* in Braddon-Mitchell's enquiry should be interpreted, as each *now* represents different meanings in Forrest's statement. Instead of asking '*how do we know it is now now?*', Forrest thinks that the more adequate way to pose this question should be '*How do we know* now_i *that it is* now_b*?*' (Forrest, 2004:358) To start with, his argument in reply to Braddon-Mitchell's objection is to distinguish one *now* from the other. The now_i represents an indexical/ token-reflexive meaning of '*now*', that is, the moment where the token of the '*now*' is, while now_b rather indicates the time that is constantly at the boundary of temporal realms, which is the present. That being said, Forrest goes on to agree with Braddon-Mitchell that merely saying this explains how it is possible for us to know if we are in the same state as a past conscious entity, such as Caesar, or Robin Hood, currently is in, as explained above, Caesar or Robin Hood might well believe that he is in the present moment as well.

Forrest, however, further develops his position by claiming that there is a distinction between activities and states in temporality. According to Forrest (2004:

359), things such as life and sentience belong in the spectrum of activities, and activities' occurrence merely happens on the edge of temporal reality. At the same time, states are something that only exists in the past. Now recall Braddon-Mitchell's claim that 'consciousness is some by-product of the causal frisson that takes place on the borders of being and non-being.' (Braddon-Mitchell, 2004: 201), Forrest has a different perspective on how to understand this. He believes that the interaction of the cause and the effect do not happen simultaneously, rather, if the cause happens in one moment, then its effect only happens in the next moment. Specifically speaking, he says:

> If x causes y then in the normal case y is after x. If there is a precise moment at which x ends then y begins only after that moment, not at it. At the precise moment of the end of the cause there is as yet no effect. (Forrest, 2004: 359)

In this statement, the end of the cause *x* and the beginning of the effect *y* do not happen at the same time, but rather happen in a sequel order, that is to say, as stated by Forrest (2004: 359), the cause *x*'s causal property has a certain tendency of producing the effect that belongs in the type of *Y*, in this case, the effect *y*.

Moreover, Forrest (2004: 359) carries on to argue that such causal activities and causal relations should not be considered as a provisional feature of the growing block view, instead, they are

> [A] consequence of combining that theory with the innocent enough supposition that causes precede effects.' (Forrest, 2004: 359)

If this is the case, then it is reasonable to suggest that life and sentience ought to be categorised as causal activities. Following this line of reasoning, that causal states only belong in the past and causal activities only happen on the boundary of

temporal reality entails that entities in the past, such as Caesar and Robin Hood, can only be in causal states rather than have causal activities. Given the distinction between the past beings and the present beings, it is reasonable therefore to say that Robin Hood, despite existing in the past, is in a causal state but not undergoing any causal activity, and so isn't having any conscious experiences, and so is in that sense 'dead'.

Although Forrest makes 'the Past is Dead' hypothesis seem like a legitimate response, there is still Braddon-Mitchell's point about special relativity to answer. Forrest acknowledges Braddon-Mitchell's concern but answers is quite simply. He states that Braddon-Mitchell can only make a case out of the combination of the growing block view and 'the Past is Dead' hypothesis when the temporal boundary in question is assumed to be flat. In other words, without the assumption that the boundary is flat, it is not necessary for the advocate of the growing block view to commit to 'a privileged relativistic frame of reference.' (Forrest, 2004: 360)

It seems, at this point, that Forrest's accounts over the growing block view and the Dead Past hypothesis provide reasonable answers to Braddon-Mitchell's enquiries. However, another metaphysician Heathwood (2005) disagrees with Forrest over his conduct of defending the growing block view, and claims that the manner in which Forrest combines the Dead Past hypothesis with the growing block view actually undermines the advantages the growing block view has over other rivals of temporality. For instance, as claimed by Heathwood (2005: 250), compared to presentism, the growing block view is supposed to have the upper hand in providing the solid truth grounding for the propositions as to the past. Nevertheless, if combined with the Dead Past hypothesis, Heathwood (2005) believes that the growing block view will have to confront the same problems all over again. In order

to support this claim, Heathwood (2005) brings up a few propositions regarding the past, and asks for the uniform account for these propositions. The first two propositions are:

> *(CC) Caesar was conscious when he crossed the Rubicon.*
> *(SA) Socrates was alive when he was sentenced to death.* (Heathwood, 2005: 250)

Clearly, these propositions about Caesar and Socrates being alive and sentient during their temporal events in the past are true. However, Heathwood (2005) goes on to offer two more propositions, which seem to be made true in the same manner the above two are made true, but Heathwood (2005) argues that it is not the case. It follows as:

> *(CW) Caesar was wet when he crossed the Rubicon.*
> *(SF) Socrates was fat when he was sentenced to death.* (Heathwood, 2005: 250)

Naturally, I, as a reader, would think that these two sequent propositions are made true the same way as the first two. As to this idea, Heathwood (2005:250) argues that it may seem so on the face of it, but by using the Dead Past hypothesis as the growing block view's defensive strategy it then generates issues for what makes each of these sentences true. The problem is, he says, either there is nothing to make the first two propositions true, or they are made true in a different way the sequent two propositions. More specifically speaking, the problem arises because the growing block view advocate defends the theory by saying that the past is dead and the sentient beings in the past are now zombies, and so cannot find truthmakers for the first two sentences. Heathwood (2005) believes that this directly leads to the

contradiction in which the first two proposition are not made true by past objects, while the sequent two propositions are made true by past objects. For this reason, the conclusion he draws is that the Dead Past hypothesis leads the growing block view into a situation in which:

> [S]ome of the semantic and metaphysical gymnastics Presentists train for but Growing Block Theorists thought they could avoid [...is required]' (Heathwood, 2005: 250 - 251).

Nevertheless, Forrest firmly believes that there is a response here. So in response to Heathwood's (2005) concern, Forrest (2006: 161) claims that offering a uniform account for these propositions is not difficult at all as long as the subject/predicate form of these propositions is understood appropriately. It is obviously true that the subject and predicate form for the propositions '*Caesar is conscious*' and '*Caesar is wet*' are almost identical, however, Forrest (2006: 161) admits that it is also true that for these two propositions in the present tense there are different types of truth-conditions, which are applicable to the past-tensed propositions as well. In short, he brings in his notion of a causal state versus a causal activity again, and argues that present tense sentences about consciousness are made true by the existence of causal activities rather than causal states, However, he then also thinks that the truth of past tense sentences about what beings did undergo causal activities is made true by the fact they are, in the back of the block, in causal states. That they are in such causal states implies that, when the were present, they underwent causal activities, and thus this is sufficient to ground the truth of the past tense sentences. As such, it is not at all clear why such so-called *presentists' semantic and metaphysical gymnastics* necessarily play a significant part in the growing block theorists' training,

for Forrest (2006) believes that consciousness has its roots deep in the temporal causation.

This more or less completes my discussion of this objection to the growing block view. I think Forrest's reply to it is convincing, and so that there are no good objections to the growing block view. But, before I finish with this section I want briefly to return to a point I raised in section 2 when discussing how the growing block view explains the flow of time and how we endure over time. There I said:

> On the growing block view this is captured by the idea that we bear a special privileged relation to the moment of time at the edge of the block. As such, defenders of the growing block can explain not only the flow of time in terms of the growing of the block, but also our experience of that flow. We bear a special relationship to the moment that is at the edge of the block, which gives rise to experiences within us, and they constantly shift as time flows because we constantly become specially related to a new moment, i.e. the one that has just now come into existence.

As such, it turns out that the arguments I have already given in favour of endurantism and the A-theory already entail that something like Forrests view *must* be true. That is, for reasons entirely independent of the "How Do We Know It Is Now Now?" objection, I came to the conclusion that consciousness and experiences only take place at the edge of the block, and so that the past is dead. This is important, because one might view Forrest's response as being an ad hoc move, designed merely to overcome the "How Do We Know It Is Now Now?" objection. But, this is not so. We have good independent reasons to believe that his response is right. And

so, this bolsters Forrest's argument, and shows even more strongly that the growing block view is the best account of time available.

This basically completes my overall argument in favour of the growing block view. But, before I finish, I wish to consider one alternative account of the growing block view due to Michael Tooley. His view is interesting because he develops a *tenseless* version of the view. Clearly, due to the fact that I have argued for the necessity of tense in reality, and so for the A-theory on this grounds, I should reject this view. And indeed I do. So, I finish by explaining why.

Section 5: Michael Tooley's Tenseless Growing Block View

Tooley develops his view in his 1997 book '*Time, Tense, and Causation*'. He argues that:

> The metaphysical hypothesis that the world is a static one does entail that there are no irreducible tensed facts, and therefore that tensed concepts cannot be semantically basic. But, on the other hand, the hypothesis that the world is a dynamic one does not entail that tenseless temporal concepts cannot be semantically basic… not only is a dynamic world perfectly compatible with the view that tenseless temporal concepts are semantically basic; it is also compatible with the thesis that tensed concepts, rather than being semantically basic, are analysable in terms of tenselss temporal concepts, together with the general concept of a dynamic world.' (1997: 19-20)

This attempt on the reconciliation of tensed and tenseless theories sacrifices some of the features that the tensed theorist emphasises most, and not surprisingly, such a statement stirs up quite a controversy among both tensed and tenseless theorists. Admittedly, this combination of complete opposite reasoning appears to be very odd

on the face of it, for Tooley's theory rejects the idea that the theory of dynamic temporality necessarily needs any irreducible and tensed propositions or facts, rather, it accepts the claim that reality amounts to solely irreducible tenseless events and propositions. Regarding Tooley's relatively strange assertion, I plan to go through three valuable objections against this line of reasoning, brought up by Storrs McCall (1994), Nathan Oaklander (1999), and Quentin Smith (2001), respectively, and by examining Tooley's replies to each of them, it helps to demonstrate an explicit layout of this theory, and will decide whether Tooley's approach is plausible or not.

To briefly introduce McCall's position in the debate, in his 1994 book *A Model of the Universe*, McCall embraces the idea that there is an essential feature of dynamic that exists within temporality, which means McCall leans towards the tensed theory's side on this matter, however, contrary to the majority of tensed temporal theories, McCall carries on to argue that instead of growing, the reality in fact shrinks over time. To be more specific, the tensed theorist usually supports the idea that the reality changes over time by adding temporal events and facts to the past through the present; but McCall believes that the reality changes over time by deleting the possibilities in the future that have not been actualised, which seems to be compatible with the concept of the open future.

Tooley (2001), however, in his response to McCall (2001) states that they agree with each other on a number of matters, such as the acceptance of a dynamic temporality, the open future, and the idea that 'the history of the world consists of tenseless states of affairs, with tensed facts being logically supervenient up what tenseless facts are actual as of different times.' (Tooley, 2001: 32) Therefore, according to Tooley, his view and McCall's are in agreement about many matters. However, there are two things on which they cannot agree with each other. One is

whether one is able to semantically distinguish truth simpliciter from truth at a time; the other is whether one should appeal to quantum mechanics in order to argue for absolute simultaneity.

According to Tooley (2001: 32- 33), McCall and he mutually agree that the concept of actual simpliciter and that of actual as of a time are both essential to the interpretation over the nature of time, yet McCall accepts that the concept of truth simpliciter is the only legitimate one, while Tooley (2001) doubts if one can semantically tell the difference between the two. The point Tooley (2001: 33) tries to make here is that if the idea of being true at a time is to be acknowledged, then the concept of truth at a time should be recognised as well.

The second dispute is on the appeal to quantum mechanics for the sake of absolute simultaneity. Traditionally, there has been a well-known collision between the theorist of dynamic temporality and the advocate of Special Relativity, for the former defends the idea of absolute simultaneity, whereas the latter is not compatible with the idea that there is '*a relation of absolute simultaneity that holds between events.*' (Tooley, 2001: 33) Before going any further, there are two points that I would like to make here: first is that it is not necessary for the growing block theorist to commit to absolute simultaneity, as mentioned earlier in the discussion over Peter Forrest's argument, each one of us could be at different points on the edge of the expanding block depending on our frames of reference; which entails the second point, that is, that the theorist of this dynamic temporal view can actually avoid the collision between the growing block view and Special Relativity. That being said, Tooley's approach appears to be compatible with Forrest's line of reasoning. However, that is just not the case in reality, for Tooley (2001) chooses to go down a different road where he claims that the future is non-branching instead of open-

branching, which he believes enables him to rightfully argue for absolute simultaneity by adopting quantum mechanics. At this point, it is not clear to me whether Tooley's argument here is a successful one.

Similarly, McCall (2001) is not that impressed by Tooley's way of conducting his argument, and argues that this line of reasoning is contradicting the traditional way in quantum mechanics when conducting a measurement. To be more specific, according to the traditional Copenhagen interpretation of quantum mechanics:

> definite values of physical quantities such as spin cannot be assigned to quantum systems unless a 'measurement' of that quantity is made" ..... even after a measurement has been made of the spin of the first electron, the second electron does not really have a spin until a measurement is made on it. (Tooley, 2001: 34)

In response to this objection, Tooley (2001) states that he finds it problematic to conduct measurements this way for the reason that, according to Tooley (2001: 34), once the measurement on the spin of the second electron would be determined once the measurement on the first electron is made. In other words, the possibility that the second electron will have the spin is determined to happen and therefore will happen *at some point, equal to one*. Nevertheless, what seems interesting in Tooley's reply is that he also admits that he does not possess the solid knowledge base as to the field of quantum mechanics as McCall does, therefore, he is not very confident with his judgment regarding the validity of his argument. Since I personally support the way Forrest explains absolute simultaneity and dodges the objection from Special Relativity, I do not see any progress that is made by Tooley here, and for this reason I do not think it is a good argument against Special Relativity.

The second main objection against Tooley's combination of tenseless facts and dynamic temporality is suggested by Oaklander. As stated above, Tooley's version of the dynamic world comprises a number of significant features many other theorists of dynamic temporality actually cherish, therefore, it would be quite unusual for any of those advocates of the theory of dynamic temporality to accept Tooley's position easily. To be more particular, in Tooley's approach, 'one can refer to moments of time either by tenseless expressions or by tensed expressions; .....and it is not the case that reference by means of tenseless expressions must, or even can, be analysed in tensed terms.....' (Tooley, 2001: 35) These two features of Tooley's ontology clearly contradicts what the majority of tensed theorists believe, despite this, Tooley claims that this contradiction does not change the fact that 'dynamic accounts of the nature of time require a temporally-indexed notion of actuality.' (Tooley, 2001: 35) As discussed earlier in the examination over Braddon-Mitchell's *'is it now now?'* argument, according to the theorist of dynamic temporality, it is true and necessary that one of the '*now*'s functions as indexical in the proposition. However, what Tooley intends to adopt for his ontology that consists of tenseless and tensed facts is not solely 'the temporally-indexed notions of what is actual as of a time, and of truth at a time', but also 'the absolute notions of what is actual simpliciter, and of truth simpliciter.' (Tooley, 2001: 36) Having these two different kinds of notions explained, it is clear to see that the theorist of dynamic temporality is willing to accept the former but the latter appears to be one too difficult for the theorist of dynamic temporality to embrace.

As mentioned above, Tooley claims to be a tensed theorist and supports that there is a dynamic world, then it is obviously contradicting to accept both ideas, therefore, it is also obviously confusing as to why Tooley would choose such a

position. In response to this confusion, Tooley (2001) explains that it is a commonly accepted principle that 'semantically basic concepts must apply in virtue of the presence of properties or relations with which one can be directly acquainted...' (Tooley, 2001: 36) and by applying this principle to this specific case, it entails that one is unable to be directly acquainted with the future facts, therefore, there is no way one can be directly acquainted with the property of futurity, and following this line of reasoning, it sums that '*the concept of the future cannot be taken as analytically basic...*'. (Tooley, 2001: 36) In order for the concept of the future to be further semantically analysed, Tooley (2001: 36) believes that what one needs in this situation is quantifiers that cover up all things that exist at any time, and that one cannot understand these quantifiers without understanding the concept of what is actual simpliciter.

Having explained these notions, Tooley carries on to argue that 'What is actual simpliciter is identical with the totality of everything that exists tenselessly; [it is also] identical with the totality of everything that is actual as of some time or other.' (Tooley, 2001: 37) Given Tooley also supports the view of dynamic world, again, it seems baffling how the total of temporal reality is static when its temporal parts change constantly. And this is exactly where Oaklander's objections take place. Although I am not too keen on Oaklander's advocate of the tenseless theory, and on his objections that suggest that views of a dynamic world should be abandoned, I think some parts of his argument against Tooley's combination of a dynamic world and tenseless facts are fairly valuable to this discussion. What Oaklander (2001) considers as problematic on Tooley's approach is that there is a contradiction between the total of temporality that does not change and its temporal parts that change their *existential status* constantly.

More precisely, Oaklander (2001) adopts an objecting strategy that begins with the assumption that the sum total of temporal reality always remains the same, which Tooley (2001) claims to be true in the light of his tenseless view. At the same time, Tooley (2001) states that every future event or state of affairs constantly change their *existential status* by coming into reality *at some point*, and the totality of temporal reality *absolutely* covers every single future event *at all times*, following this line of reasoning, it obviously entails that the totality of temporal reality contains temporal parts that constantly come into existence and change their existential status. Furthermore, it is also reasonable to say that if a totality contains some parts that constantly change by coming into existence, then it is impossible for this totality to remain exactly the same, if following this line of reasoning, then it entails that such totality cannot always remain the same. Clearly, the result of this deduction is conflicting with the primary assumption that the totality always remains the same. Accordingly, some of these statements above must be false.

In reply to this counter argument, Tooley (2001: 38) states that the totality of temporal reality cannot change, for it is not temporally indexed. Now, this response seems a little blurry to me as whether it is temporally indexed or not does not change the fact that there is a change in future events' existential status, and as long as the change exists, there is a change within temporal reality. Tooley (2001) then goes on to argue that there is a misunderstanding as to the expression '*existential status*', which causes the problem. According to Tooley (2001: 38), such an expression obscures the difference between the totality of what is actual simpliciter and the totality of what is actual as of any given time. However, it is also his claim that '*the totality of what is actual as of any one time is necessarily different from the totality of what is actual as of any other time.*' (Tooley, 2001: 38) Despite that he explains that

this does not mean that there is also a different between actual simpliciter at one time and that at any other time, this necessary difference does indicate a change in the existential status or property. For this reason, I think Tooley needs to offer a further explanation.

The last main objection against Tooley's ontology I would like to go through focuses on whether Tooley's ontology is in fact a tenseless view at its core, rather than a tensed theory. Quentin Smith (2001), in his paper '*Actuality and Actuality as of a Time*', offers his insights on Tooley's 1997 book '*Time, Tense, and Causation*' and suggests that despite that Tooley appears to be an advocate of views of dynamic temporality, his temporal ontology is in fact a tenseless one. Smith (2001) starts his discussion by giving his fairly straightforward opinion on few significant features of the tensed theories that Tooley gives up in order to make his argument ontologically work in a tenseless sense. Since Tooley (1997) believes that temporality consists of tenseless events, facts, and states of affairs, while the tensed theorists believes the opposite, the first tensed feature Tooley (1997) compromises, according to Smith (2001: 20), is that tenseless concepts can be semantically reduced to tensed concepts, namely, the past, the present, and the future. Furthermore, as above mentioned, Tooley does not believe that the concept of the future is semantically basic, so the second feature he decides to give up is fairly obvious, that is, that the concepts of past, present and future are semantically basic; thirdly, due to the advocate of tenseless facts, Tooley (1997) rejects the idea that 'familiar tensed sentences do not include indexicals and express the same proposition at different times of utterance.' (Smith, 2001: 20) Moreover, as demonstrated earlier, Tooley explicitly appeals to quantifiers that cover all things at any times in order to save the concept of the future, for this reason, he clearly considers the quantifiers more

valuable than tensed facts; and last but not least, since he claims that the sum totality of temporal reality is not temporally indexed, it is fair to say that he rejects temporally indexed concept of truth.

Having listed the important aspects of tensed theories, Smith (2001) takes on the phrase '*actual as of a time*' adopted in Tooley's argument to pose the question that it is rather blurry as to what this phrase actually means. He suspects that Tooley himself does not even know how to explain and that is precisely why he claims that 'this phrase expresses a primitive, unanalysable notion,' (Smith, 2001: 22), just in order to avoid giving any further explanation.

Smith (2001) then claims that there are several argument Tooley (1997) offers in hope of establishing his tenseless/tensed ontology that appear to be invalid. The first argument is that '*propositions, numbers and uninstantiated universals do not exist in time and therefore that a distinction is needed between actuality simpliciter and actuality as of a time.'* (Smith, 2001: 22) The point I intend to make over throughout this discussion is that I do not think there is a necessity for a distinction between actuality simpliciter and actuality as of a time, for I do not believe that everything in our temporal reality is tenseless, the distinction between the two actualities seems redundant to me. The second argument is Tooley's explanation (1997: 40) regarding why the distinction between the two actualities is required: apart from the ability to understand what is actual as of the present, one also needs the ability to understand propositions regarding the totality of what is actual at some time or other. Again, I do not think there is a need to distinguish actuality as of a time and actuality simpliciter, the required ability here is not really necessary. Smith (2001: 22) thinks that this argument begs the question because one of its premises assumes that there is necessity for two different notions of actuality and the conclusion

proceeded from this premise backs it up, which is not legitimate.

I have now examined the objections from all three metaphysicians, and it seems like that Tooley does not have an upper hand on this combination of a dynamic temporality and tenseless facts. Therefore, Tooley's version of a non-dynamic growing block view must be rejected.

Conclusion

This chapter completes my survey of the metaphysical view of time. I have rejected presentism, the B-theory, and the moving spotlight view, and argued that the growing block view solves all the problems that these views face whilst facing no insurmountable problems of its own. I therefore conclude that growing block view is to be accepted. In the next chapter I turn my attention to the metaphysics of laws and causation.

Chapter 6

For the Humean Theory of Causation and Law

Introduction

So far in this thesis I have argued in favour of one particular metaphysical view of time, namely the growing block theory. I now turn my attention to a different topic, that of causation and the laws of nature. Whilst it took five chapters to establish which view was correct with regards to time, it will take only one chapter to establish which view is correct with regards to causation and the laws of nature. This is because I think there is a profound and compelling argument that tells directly in favour of one particular view. And that argument was given more than three hundred years ago, by David Hume. Hume argues, in effect, that there is no productive power in nature, i.e. that causation is mind-dependent, and that the laws of nature are thus not things in the world that *make* things happen. Rather, on Hume's view, a law of nature is simply a regularity that we suppose, for psychological reasons, will continue to hold in the future. I think that Hume's argument for this conclusion is entirely compelling and I accept it.

In this chapter, after briefly discussing some background issues in section 1, I then outline Hume's view of induction in section 2. I then build upon this to give his account of causation and law in section 3. I consider an objection in section 4 due to Mackie, and then consider a development of Hume's basic view, due to Lewis, in section 5. Finally, I consider an alternative account of causation in section 6, the

powers view, and reject it. I conclude by endorsing a Humean view of causation and laws.

Section 1: Background: Aristotle's Influence

Modern philosophers' attempts to interpret the phenomenon of causes and effects trace back to as early as Aristotle's era (384 - 322 BC) where he initiated a distinction between knowledge and opinion. To be more specific, Aristotle believes that knowledge is about what is necessarily true while opinion is about what can be true and false. In other words, knowledge represents what is always true, while opinions are all about changes in truth-value. Following this line of reasoning, it entails that '*truth is the first point of distinction between knowledge and opinion…*' (Olesiak, 2011: 172) What is more, since opinion implies that there are possible changes in the truth-value of objects, but knowledge entails necessity in the truth value of objects, so it is fair to say that the actual difference between knowledge and opinion lies in necessity. That being said, Aristotle claims that scientific knowledge:

> is commensurately universal and proceeds by necessary connections, and that which is necessary cannot be otherwise [while opinion is] things which can be true and real and yet can be otherwise. (APo 88b32)

Despite the fact that the contemporary discussion in terms of causation has not adopted his account of causation, his distinction in the sequent later development has been adopted as the default distinction between scientific knowledge and

opinion in their own discussions upon causation, therefore, such distinction has gradually become part of the traditional metaphysical view on causation.

Section 2: Hume on Inductive Inference

However, one of Hume's signature moves when he joins the conversation of causation is that he ignores Aristotle's distinction, and introduces a new one that categorises all human knowledge into two distinctive kinds, namely, '*relations of ideas* and *matters of fact*.' (EHU, 4.1.20) Regarding our casual inferences from the external world, it is natural to ask what kind of connection there is between the existing facts and our inferences from these facts, and how such connection is established. Given the two sorts of human knowledge mentioned above, if there is such connection between our reasoning and events/objects in the external world, then it is established by either of these two kinds of knowledge. Yet, Hume (EHU, 4.1.23) goes on to state that relations of ideas cannot be involved in the process of our causal inferring, which means that matters of fact are the only kind of knowledge that is approved by Hume, and therefore responsible for our causal inferences from the external world. According to Morris, The philosophical rivals of Hume apparently disagree with him on this brutal approach to causality, and therefore call Hume's distinction between *relations of ideas* and *matters of fact* Hume's Fork, which is tinged with their sentimentality for the loss of *relations of ideas*.

More precisely, Hume (EHU, 4.1.23) does not consider *relations of ideas* as the foundation upon which our inferences of causality are based for two main reasons generally. One is that reasoning derived from relations of ideas only generates *a priori* knowledge, which, to Hume, do not apply to empirical matters of fact and is therefore unacceptable; and the other is that it leads to a contradiction

when negated. In regard to the first reason, a priori knowledge is not capable of providing a legitimate base for our causal inferences, for *a priori* knowledge, as Morris puts it, is:

> [D]iscoverable independently of experience by "the mere operation of thought", so their truth doesn't depend on anything actually existing. (Morris, 2001)

For instance, the fact that it is commonly known that a Euclidean triangle's interior angles are 180 degrees in total does not entail any actual existence of Euclidean triangles. Nevertheless, it is also contradictory for one to suggest otherwise. In other words, the lack of the existence of Euclidean triangles does not enable one to suggest that the interior angles can be 179 degrees or 182 degrees. Therefore, there is a contradiction when one attempts to negate such proposition, which explains the second reason.

Contrary to *a priori* knowledge, Hume believes that one can only depend on *a posteriori* knowledge in order to generate causal inferences from what one observes. When describing human perceptions over causal phenomenon in the natural world, Hume states that:

> [W]e always presume, when we see like sensible qualities, that they have like secret powers, and expect that effects, similar to those we have experienced, will follow from them. (EHU, 4.2.1/33)

Following Hume's description, it shows that one can only get causal inferences as to objects and events from what is repeatedly experienced. For instance, I take myself to know for a fact that the glass in front of me will be filled with water if I pour some water into the glass steadily, because I have done this before and had experiences

of it in the past. These experiences are the source for me to gain *a posteriori* knowledge that there is a causal relation/order between me pouring water steadily and the glass being filled with water.

Let's take a closer look at this example. In regard to the event of me pouring water into a glass, there are two propositions that can be made here: (i) a glass being filled with water always follows my pouring water into the glass steadily; and (ii) my current action of pouring water steadily into the glass is similar to these actions I have performed before and will cause the glass in front of me now to be filled with water. According to Morris (2001), the logical connection between these two propositions does not appear to be intuitive, therefore, by providing the chain of reasoning between these two propositions, we can demonstrate Hume's reason to embrace matters of fact as the source of causal connection, rather than relations of ideas. Like the distinction between relations of ideas and matters of fact, there is also a distinction between *demonstrative reasoning* and *probable reasoning* due to Hume's view:

> All reasonings may be divided into two kinds, namely, demonstrative reasoning, or that concerning relations of ideas, and moral [probable] reasoning, or that concerning matter of fact and existence. (EHU, 4.2.18)

As mentioned above, a priori knowledge leads to a contradiction when negated, yet, there is no contradiction in thinking that the glass might not be filled with water when I pour the water in for there is a possibility that the glass just might break due to a crack I did not notice. Hume therefore rejects the possibility that demonstrative reasoning could be the one that helps fill the gap between the two propositions.

Despite that relations of ideas related demonstrative reasoning does not meet Hume's standard, one should not feel too optimistic about probable reasoning at this point, for Hume does not think probable reasoning alone is capable of playing this fundamental role either. According to Morris (2001), one will end up running in a vicious circle if one attempts to infer proposition (ii) from proposition (i), because it will eventually get to the point where it involves the question one intends to answer in the first place. With demonstrative reasoning entirely rejected, probable reasoning remains as the only means one has to connect the propositions, and therefore needs some extra aid in order to make sense. To be more precise, proposition (i) indicates events in the past, while proposition (ii) shows something that is most likely to happen in the future, and there needs to be some principle to be the source for probable reasoning and to ensure that the past is connected with the future causally.

Some suggest that such aid should be what is called *uniformity principle*. According to this principle, the future will resemble the past. Although this principle appears to be able to enable one to fill the gap between proposition (i) and proposition (ii) with *probable* reasoning, Hume (EHU, 4.2.18) claims that this principle is neither *intuitive* nor *demonstrable*, and therefore could only be supported by the *probable* argument. However, a problem arises when applying this principle to the *probable* argument. That is, that if one intends to establish an argument using the uniformity principle, then at some point the argument will have to include the principle itself as part of it, which spells a vicious circle. For this reason, it is neither the uniformity principle nor probable reasoning that has what it takes to link proposition (i) with proposition (ii), and the gap between them is still to be filled.

In effect, at this point, Hume has argued that reason cannot fill the gap. But, the question remains: if we do not infer proposition (ii) from proposition (i) by the use

of reason, why *do* we infer proposition (ii) from proposition (i). With regard to this lack of faith in reason, Hume considers his own view as giving rise to *sceptical doubts*, which, according to Hume, are not a '*disagreement, but rather an incitement, as is usual, to attempt something more full and satisfactory than has yet been proposed to the public.*' (EHU) With the sceptical doubts revealed, Hume carries on to offer his *sceptical solution*.

If not reason, then there still needs to be a principle that explains why we are lead to make causal inferences. Instead of reason, Hume insists that it is *custom* or *habit* that enables us to form causal inferences from the natural world, as Hume states:

> This principle is Custom or Habit. For whenever the repetition of any particular act or operation process a propensity to renew the same act or operation, without being impelled by any reasoning or process of the understanding, we always say, that this propensity is the effect of Custom. (EHU, 5.1.5/43)

Having defined this, Hume claims that one forms a certain propensity from repeated experiences. Take my pouring water into a glass scenario for an example again, if I apply the notion of custom to this process, then it entails that custom is my propensity to form the judgment there is a causal process here because in the past I have experienced pouring water into a glass and the glass being filled subsequently. Therefore, it is commonly agreed that custom and habit in Hume's description are actually not something new, rather, they are only different names for the *principles of association*. To be more specific, Hume's definition over the principles of association is that:

> …there appear to be only three principles of connexion among ideas, namely, Resemblance, Contiguity in time or place, and Cause or Effect.' (EHU, 3.2/24)

As above-mentioned, in Hume's argument, one forms a certain propensity from repeated experiences, and propensities from custom and habit, which obviously represent the same thing as these three principles of connections among ideas. That being said, it is fair to claim that the principles of association are the more detailed description of custom and habit.

Thus, it is safe to say that Hume in his theoretical conduct values custom greatly and believes that custom on its own can provide the supporting explanation of why we believe certain future events will go down the way similar events have gone down in the past, and for this reason, it can also be the source of the uniformity principle above-mentioned.

However, many believe that causality is without a doubt an objective phenomenon in the natural world, and that causal relations between events and objects take place all the time regardless of whether any of us are there to observe them or not. In response to this conventional impression, Hume suggests a distinctive way to understand causality. His explanation is that the tendency to believe in causality is a mental feature of human nature, while causality in fact only exists in our custom formed by our repeated experiences. In other words, it is our *belief* that leaves an inaccurate impact on the perception of causes and effects. For this reason, It is rather necessary to explain *belief* the Humean way, and also clarify why a person believes that she can expect and perceive an effect whenever a cause takes place, given belief is described to be of inaccurate impacts.

With regard to this request, Hume offers his interpretation over belief by asking what is supposed to be involved in forming one's belief that there will be a

certain causal relation between two objects or events during the interaction between the two objects/events. Take the glass being filled with water again for an instance, what is it that grants me this belief that when I pour some water steadily into the glass in front of me, the glass will be filled with water correspondingly? Hume responds to this question by first noting that human minds are capable of freely and randomly combining, merging, splitting and separating any ideas. Given this, it is clearly not the case that our imaginiative use of ideas that invariably leads us to the belief that the glass will be filled with water, for a human mind can add any ideas. With ideas alone being ruled out, Hume goes on to state that it is our *emotions* that help in our formation of beliefs. To be more specific, Hume claims that '*belief must be some sentiment or feeling aroused in us independently of our wills, which accompanies those ideas that constitute them.*' (Morris, 2001) As to this statement, there are two obvious enquiries that need to be posed here. One is that although Hume claims that it is sentiment or feeling that help to form beliefs, he still needs to offer an accurate definition of sentiment and feeling in the context of this argument. The other enquiry is what kind of role that ideas, combined with emotions, play in the process of forming a belief.

Regarding the first enquiry, Hume thinks that it is not possible to define sentiment or feeling, but it is entirely possible to define what belief is. According to Hume, my believing that the glass in front of me will be filled with water is as unavoidable as other sentiments, such as feeling delightful when a good thing happens, or feeling confident when a challenge takes place. It seems that these sentiments and feelings come into one's mentality without any interruptions of reasoning. Therefore, he says:

> All these operations are species of natural instincts, which no reasoning or process of the thought and understanding is able either to produce or to prevent. (EHU, 5.1.8: 46-47)

In other words, just like the ability to have sentiments or to feel, belief is also something that exists in human nature which closely associates with sentiments and feelings. Nevertheless, Hume never gets the chance to discuss and explain *belief* in full detail. What he does describe in terms of belief is that *beliefs* are lively, vivid conceptions of an event:

> which renders realities, or what is taken for such, more present to us than fictions, causes them to weigh more in the thought, and gives them a superior influence on the passions and imagination. (EHU, 5.2.12: 49)

Based on this description, Hume obviously recognises the ontological significance *belief* has, but since there is not a full discussion of *belief* in Hume's account, it is uncertain what exactly Hume would say as to belief in more detail. Despite the lack of description, when it comes to belief having a 'superior influence' on the passions and imagination, I believe it is compared to either 'sentiments or feelings', or the ability to have sentiments or to feel.

Section 3: Hume on Necessary Connection and Laws of Nature

There is another significant aspect of Hume's approach to causality that I need to address here, that is, his attitude towards necessary connection between a cause and its effect. Many hold the traditional view that there is necessary connection within causality to ensure that the effect not only happens, but also happens in a

certain way after its cause takes place. And, to make sure the causal interaction between a cause and its effect happen in a certain way, there is definitely a demand for necessary connection in between, and some attempt to maintain this causal connection. Hume, on the other hand, thinks otherwise. He does not think that there is such thing as necessary connection nor any supporting sources whatsoever. Furthermore, he also identifies three different kinds of sources needed for necessary connection, and denies them all. So, it is sensible to start with the three sources and then move onto the discussion of necessary connection, for if these sources are not legitimate and useful as they should be, then the legitimacy of necessary connection between a cause and its effect will also be reconsidered.

According to Locke, we obtain the idea of necessary connection by having impressions regarding the interactions with the natural world and with our own mental awareness, and accordingly, these impressions are to be categorised into external and internal. To be more specific:

> [W]e get our idea of power secondarily from external impressions of the interactions of physical objects, and primarily from internal impressions of our ability to move our bodies and to consider ideas. (Morris, 2001)

Notice the term ‘power’ in the quote. Some may ask what this ‘power’ represents. Since there is a common belief that there must be some kind of force or energy that necessarily brings a cause and its effect together, so such energy or force is also known as necessary connection between a cause and its effect. Back to the discussion, according to Hume, external and internal impressions are the first two kinds of sources required by necessary connection, and the third source is what

Malebranche calls the ‘occasion for divine action’. Clearly, the third source is attributed to God’s will, which seems already dubious to me, as I believe that the existence of God needs to be proved to be true before one can attribute anything to God’s will. Anyhow, Hume does not think any of these sources are actually qualified to maintain an idea like necessary connection, and therefore, rejects them all.

I start with external impressions. As stated above, we obtain this kind of impression by having interactions with objects in the physical world. Hume argues that these impressions cannot really enable us to form the idea of necessary connection. For example, when seeing someone play during a billiards game, many would assume that the sequent motions of the balls are caused by the balls the player hits, and some would thus naturally believe that these motions are the evidence that there is a necessary causal connection between the motions of these billiard balls, but Hume does not think that this is the case. It is not connection of any sort we observe when we see the motions of billiard balls, rather, it is a constant conjunction of these billiard balls we observe.

As for internal impressions, we get this kind of impressions by being able to have bodily movements and to process information and ideas. Nevertheless, Hume rejects the idea that these physical and mental actions are caused by internal impressions. More precisely, although it is true that our bodily movements operate based on what brain signals they receive, Hume insists that the intentions to have the bodily movements do not derive from the internal impressions of our mental awareness, rather, according to Morris (2001), these actions should be considered as matters of fact which each of us learn through repeated experiences. More specifically speaking, when one takes some actions, such as opening the window, one just moves the hand onto the window handle and rotates it, during this process,

one is not aware of exactly *how* every mental action takes place the way they do and have control over limb movements, and accordingly, one is not aware of the internal impression of the will power.

Furthermore, Hume maintains, the mere ability we have to exert apprent influence over our thoughts and actions doesn't give us an impression of power, or necessary connection, either. That is to say, like bodily movements, we know that we are capable of forming ideas but we do so without knowing *exactly how* we form these ideas. For example, nearly every human being with a functioning brain and mentality has experienced some occasions in their lives where they have negative thoughts and ideas they do not want to experience, and yet these ideas still keep occurring. On these occasions, each human being is perfectly capable of forming ideas but none of us knows *exactly how* or *why* these ideas are formed. That is also to say, there are limitations upon our control over our thoughts and ideas, that being said, Hume claims that we can only learn these limitations by experiencing them repeatedly. Correspondingly, internal impressions are considered as ambiguous as external impressions in Hume's view.

The third and final source Hume considers is the notion of *occasion for divine action*, derived from Malebranche's occasionalist view. According to his view, 'every detail of nature is willed by God.' (Dreher, 2017: 344) Clearly, his appeal to God's will in order to explain causality is not going to sit right with Hume, as the former rely on God for the explanations of absolutely everything, while the latter emphasises the significance of experience. If one attempts to understand or prove something inconclusive by attributing it to something else that is even more inconclusive, then it is fair to say that one begs the question. And I think this is exactly what Malebranche's strategy is. Some may disagree with me on this matter, and argue

that there is a great deal we know about God, such as the fact that God has created everything on this planet and is aware of absolutely everything that has been going on. In response to this, I think it is entirely necessary to conduct all discussions and arguments strictly with scientific and philosophical methods; and I believe that Newton agrees with me on this, as he 'correctly insists that appeals to God are expressions of religious faith and are not part of scientific theory.' (Dreher, 2017: 342) Therefore, appealing to God's simply does not solve the issue here.

Nevertheless, some still believe that Malebranche's position cannot be given away this easily, there must be more that can be said regarding the rejection of this view. If the problem with its method is not enough to rule this view out, then the problem of specificity within Malebranche's view is something which cannot be overcome, not even by God's will. To be more specific then, it is commonly known in the philosophical world that Malebranche and Hume hold different views on causality, as stated by Dreher (2017: 332), for Malebranche, there are necessary causal connections, whereas Hume only believes that there is nothing but contingenct constant conjunction. However, it is also believed that the more fundamental difference between Malebranche's view and Hume's is about their different opinions on scientific explanation.

When one attempts to provide a genuine scientific explanation with regard to a certain natural phenomenon, this explanation should demonstrate all the specific details regarding the circumstances in which the phenomenon takes place. Take Dreher's (2017: 332) cannonball phenomenon for an example, when one tries to scientifically explain the event of a cannonball falling to the ground, it requires more than merely a plain account over why it happens, instead, this explanation should cover other significant aspects, such as the time it will take to fall, and the velocity of

its falling, etc. Clearly, Malebranche's view of God's will does not contain these more detailed evidence/statistics, and therefore cannot be viewed as evidently trustworthy. Accordingly, this incapability with Malebranche's occasionalist view is what Dreher (2017) calls *the problem of specificity.*

Hume also weighs in on this matter by giving another example: the explanation over the fact that food nourishes. It is not the question of why food nourishes, far more than that, it is the questions of exactly what it is in food that nourishes and of how the process is supposed to work. Take bread for an instance, according to Dreher (2017: 333), if one intends to scientifically explain the phenomenon that bread provides one's body with certain nourishments, then it is necessary for one to explain the process of how the proteins in the bread turn to amino acid in one's digestive system. In other words, 'it is the specificity of natural science that integrates all the events into a unified whole that explains more general phenomena.' (Dreher, 2017: 333) Compared to the scientific explanation, Malebranche's view of God's will obviously lacks of the precision required for scientific and philosophical conducts, therefore, this third source is proven to be unadoptable.

With these three sources being disproven, Hume argues that without these sources, there cannot be any necessary connection between an event and its sequent. Hume's argument for this claim takes three steps. The first step is to pin down the natural phenomenon in which, according to Hume (EHU, 7.28), one event is constantly conjoined with another, we begin to expect the one to occur when the other does. As mentioned above, there is a tendency in human nature to believe in causality. Intuitively then, we assume that there is some kind of connection between these events, and in order to define this very connection, we call the earlier event the

cause and the later event the effect; and the second step is that by repeatedly experiencing the constant conjunction, we also discover that these repeated cases took place in almost identical fashion, therefore, custom/habit allows us to foresee the effect when its cause takes place; the third and final step is Hume's conclusion that 'our awareness of this customary transition from one associated object to another..... is the source of our idea of necessary connection.' (Morris, 2001) In other words, *necessary connection*, in Hume's understanding, is nothing more than what he calls *constant conjunction*.

One point that follows immediately from the above discussion regards the laws of nature. As a necessary connection is simply a constant conjunction, it follows that what we think of as being laws of nature are simply constant conjunctions that do in fact continue to hold universally, i.e. for all times. Thus, it follows that something is a law of nature, for Hume, if as a matter of fact it is a regularity that fails to have an exception. Of course, regularities that have held up until now may not continue to hold, and we have no *reason* to think they will. But, if as a matter of fact, we discover a regulatity that we have never known to fail, despite countless instances of occurance, then we will think of this, for psychological reasons as being something that hold universally across all time. And if, as a matter of fact it does so continue to hold, we may rightly call this a law of nature. The important point to note about this is that laws of nature, so conceived, are derived from the regularities we observe, and so do not (and *cannot*) produce those regularities. Thus, laws of nature are not themselves built into the fabric of the world in any fundamental sense. Rather, they supervene upon what regularities, as a matter of fact, continue to hold.

Section 4: Mackie's Objection: INUS conditions

To continue with the discussion, I now turn to an objection to the Humean view, given by Mackie in his 1965 paper *Causes and Conditions*. His objection focuses on the notion of there being an *insufficient but necessary part of an unnecessary but sufficient* condition, also known as an INUS condition. In short, his objection to Hume is to say that we need not appeal to the notion of necessary connection in order to explain causation. As such, his argument is that Hume attacks a straw man, and that as such, we have no reason to accept, for the reasons Hume gives, that we cannot explain causation as being mind-independant. In other words, if the notion of causation does not involve the notion of necessary connection, then Hume is barking up the wrong tree in attempting to explain causation, and therefore we do not need to follow him and agree that out concept is based on nothing more than that of constant conjunction. However, obviously this depends on the plausibility of Mackie's own account, to which I now turn.

For the purpose of saving objective mind-independent cause and effect, Mackie starts his argument by posing a case in which a house is half burned down, and after a thorough investigation, the investigators announce that it was an electrical short-circuit that actually caused the fire. Regarding this case, Mackie (1965: 245) states that the short-circuit is actually neither sufficient nor necessary for the fire, and yet, it is the very cause of it. To be more particular, it is not sufficient because the short-circuit alone would not have caused the fire, there needed to be other conditions for the fire incident to happen, such as the malfunction of the sprinklers, and the flammable goods close by; also, the short-circuit is not necessary for the fire either, for something else, such as fireworks, could have caused it as well.

However, Mackie (1965: 245-246) also argues that since it is the short-circuit, the malfunction of the sprinklers, and the flammable objects close by that caused the fire, therefore, the short-circuit is part of a sufficient condition for the fire incident to happen; furthermore, the malfunction of the sprinklers and the flammable objects would not have caused the fire without the short-circuit, for this reason the short-circuit is a necessary part of this sufficient condition. Having explained this case, Mackie (1965) then goes on to conclude that the short-circuit is an *insufficient but necessary part of an unnecessary but sufficient* (INUS) condition for the fire. Furthermore, Mackie also offers his definition of this condition, which follows as:

> A is an INUS condition of a result P if and only if, for some X and for some Y, (AX or Y) is a necessary and sufficient condition of P, but A is not a sufficient condition of P and X is not a sufficient condition of P. (Mackie, 1965: 246)

With regard to this definition, Mackie (1965) predicts some potential issues that might be pointed out, and accordingly adds some additional description to it. Although this account of INUS condition is an attempt to explain causation, Mackie (1965) points out that there are some causes that are non-INUS conditions. More precisely, besides INUS conditions, there are independently sufficient conditions. Take an example to explain independently sufficient conditions, say I got waken up very early this morning by a passing by truck which was particularly loud. In this case, the passing loud truck is an independently sufficient condition for my waking as the effect; furthermore, there are also causes that are necessary parts of necessary and sufficient conditions, a perfect example for this kind of causes is, according to Duxbury (2016), if one cracks eggs in boiling water, then one will end up with some poached eggs. In this example, cracking the eggs is the necessary part of a

necessary and sufficient condition for the making of the poached eggs. So at this point, it seems like that there has to be an expansion on the spectrum of INUS conditions.

In response to this demand for an expansion, Mackie (1965: 247-248) states that this category of conditions does not exclusively include INUS conditions, also, it includes independently sufficient conditions as well as necessary parts of necessary and sufficient conditions. Correspondingly, Mackie (1965: 249) claims that A is a cause of P if and only if A is at least an INUS condition of P; also, A is at least an INUS condition of P if and only if (1) A is an INUS condition of P, or (2) A is an independently sufficient condition of P; or (3) A is a necessary part of a necessary and sufficient condition of P.

On the face of it, by expanding the range of INUS conditions, it successfully solves the potential problems the independently sufficient conditions and the necessary parts of necessary and sufficient conditions may cause. Yet, it is not enough to cover all the other conditions that might play a role in influencing an effect. Back to the house fire case for an example, although the short-circuit is the cause of the fire, it would not have happened without oxygen in the house, therefore, one can argue that the fact that there was oxygen in the house also played a significant role in influencing the effect which is the house being on fire, but this condition is not included in Mackie's INUS condition category. To take this case even further, one can argue that the fact that the planet earth is not being destroyed is also a condition for the fire, so one can say that it is the fact that the planet earth is not being destroyed actually caused the fire. Due to this reason, it seems like Mackie has to either expand the INUS condition archive even further or explain the conditions like oxygen in the house fire case.

I think that it is obviously pointless to keep expanding the list of INUS condition, for there would not be an end to it, and at this point, the only solution for this problem is to find a way to explain all the other factors that also contribute to the effect of a causal relation. The solution Mackie (1965) offers is a notion called a 'casual field', which restricts and determines what conditions should be considered as causes and what should not. To be more specific, Mackie (1965: 249) explains this notion by first stating that the question 'What causes influenza?' is incomplete and indeterminate, for this question can be interpreted in two ways, one way focuses on what generally causes influenza in human bodies; the other way is to understand it as 'given the fact that influenza is present, what it is that makes some people fall victim to it but others do not?' Also, since these two questions concentrate on different aspects of influenza, the causal fields for these two questions are therefore different as well. According to Mackie (1965: 249), for the former way to understand it, the causal field is simply human beings, while the causal field for the latter is *human beings in conditions where influenza viruses are present*. Having explained these two ways to understand the question about influenza, it is now clear what a causal field is:

> In all such cases, the cause is required to differentiate, within a wider region in which the effect sometimes occurs and sometimes does not, the sub-region in which it occurs: this wider region is the causal field. (Mackie, 1965: 249)

By setting up the restrictions of the causal field, Mackie (1965) asserts that the so called background conditions can be seen as part of the causal field, and thus a part of the causal paradigm.

What is more, another important aspect of the background conditions Mackie (1965) holds is that they are *fixed*. For example, in the house fire case, the facts that there is oxygen in the house, and that the planet earth is not being destroyed are all *fixed* background conditions, that is to say, A is a cause of P if and only if A is at least an INUS condition of P relative to the causal field C. Following this line of reasoning, since these conditions are fixed, Mackie (1965) thinks that naturally these conditions should be seen as part of INUS conditions by default. At this point, it seems that Mackie's strategy of the causal field successfully explains the background conditions in the context of INUS conditions, However, one issue arises here, that is, that Mackie is obliged to offer an explanation as to what actually fixes these background conditions.

There are two replies that can be made here to this enquiry, it is the context of discussion that fixes the background conditions or the causal field, or it is something else. Mackie (1965) neither says that it is the context of discussion nor does he specify anything else that could fix the background conditions. Therefore, it seems as if only the context of discussion can fix the background conditions, but then a problem occurs: if it is the context of discussion that fixes the background conditions, then it makes causation potentially subjective, which then means it is mind-dependent. Again, mind-dependence is something Mackie wants to avoid, because it will entail that causation is generated by habit, which exists only in human minds. One could reply to this by saying that the background conditions are fixed by the context in an objective way, but without any supporting evidence, this assertion itself is considered subjective. Therefore, this attempt by Mackie to preserve causation from Hume's view does not work out. What Mackie's (1965) theory lacks is the feature of mind-independence for the causal field, but at this point, it seems too

difficult for the advocate of mind-independant causation to obtain such independence and to also offer a convincing account over it. And so I conclude that Hume's argument survives Mackie's attempt to offer an alternative account.

Section 5: Lewis's view

I now turn to David Lewis's development of Hume's view. Lewis' (1973, 1986) development is a modal realist view on causal dependence that relies upon counterfactual theory. His approach to explaining causation is different from Mackie's (1965), and for Lewis (1986), something is a cause because *if the cause had not happened, the effect would not have taken place*. In order to explain the truth of these counterfactual sentences Lewis argues that we must make use of the notion of possible worlds, and the idea that some worlds are closer to ours than others. The basic idea is that such counterfactual sentences are true iff in the closest possible world to ours in which it is true that the cause does not happen, the effect also does not happen. But, crucially, Lewis argues that we must appeal to the idea that our world has laws of nature that are given in terms of constant conjunctions. In short, the simplest system of regularities that hold within a world are taken to constitute the laws of nature, and a large part of what makes a world is closer to ours if the same regularities hold (i.e. if if has the same laws of nature). Such claim certainly looks familiar, because it is compatible with Hume's claim that that necessary connections are not part of the world, but that all there is is constant conjunction. The laws of nature, on this view are nothing other than regularities, and what causes what is based upon what regularities hold. Accordingly, one significant feature of Lewis' theory is that this approach is derived from Hume's ontology of mind-dependent causation, and therefore, a Humean view.

To be expand on Lewis' view, the first thing to notice is that Lewis' (1986) claim that *if the cause had not happened, the effect would not have taken place* is slightly different from the standard 'if... then' form of indicative conditionals, and this is generally counterfactual conditionals' trademark for it means what would have been or what might have been. For example, say if it had snowed, the local council would have put some salt on the road. According to Lewis (1986: 22), counterfactual conditionals are represented as 'A□→C', which means if it were the case that A, it would be the case that C. Introducing counterfactual conditionals is the first step of Lewis' (1986) argument, and the second step he takes is to make the statement that there are various concrete possible worlds besides ours. More precisely, Lewis (1986) believes that there are other concrete worlds that actually exist like the one we are living in, and that they are similar to ours but contain what might have been.

To be more detailed about the notion of possible worlds, although the majority of current philosophers, such as Plantinga (1974), who takes possible worlds to be an abstract notion, it is not the case in Lewis' realist argument. According to Lewis (1986: 81), all these possible worlds and the individuals in them are concrete. Furthermore, given we happen to live in the actual world and possible worlds are what thing might have been, there is a relation of comparative similarity between possible worlds, and of all these possible worlds, some worlds are closer to actuality than the others. That is to say, if one possible world is more similar to the actual world than the another possible world, then the first possible world is closer to actuality than the second. Also, regarding similarity, as above mentioned, some possible worlds are more similar to actuality than the other, which means that there is a relation of similarity between these possible worlds, as well as that they can be

put in order based on their relative similarities to actuality. Last but not least, each possible world is the closest to itself.

Moreover, since Lewis' causal account originates from Hume's causal theory, it means that Lewis is as sceptical about necessary connection between a cause and its effect as Hume is, and in his argument, such connection is what he calls causal dependence. Having said that, Lewis (1973b, 559) believes that despite that causal dependence between real events is sufficient for causation, it is actually not necessary. And as stated above, the claim that *if the cause had not happened, the effect would not have taken place* indicates that there is a causal dependence between a cause and its effect. Specifically speaking, 'We think of a cause as something that makes a difference, and the difference it makes must be a difference from what would have happened without it. Had it been absent, its effects - some of them, at least, and usually al - would have been absent as well.' (Menzies, 2001) Thus, Lewis aims to explain causation in terms of causal dependence, and also to explain causal dependence in terms of counterfactual dependence.

With the notions of counterfactual conditionals, possible worlds, and similarity established in the argument, Lewis claims that a counterfactual formula 'A □→ C' is true if and only if in the closest possible worlds in which A is true, C is also true; therefore, a counterfactual formula 'A □→ C' is true if and only if one of the following conditions is satisfied:

(1) there are no A-worlds.

(2) the actual world is an A-world, and a C-world.

(3) the closest A-world are C-worlds.

Following Lewis' line of reasoning, 'if it were the case that A, it would be the case that C', or the simplified version 'A □→ C', it is natural to suggest that A causes C means that if it were not the case that A, it would not be the case that C, which is

represented as '¬A □→¬C'. That is to say, in order to state that C is causally dependent on A, we can put this in the form of a counterfactual conditional. Consider the house fire case again, a short-circuit takes place in a house and after a while the house is on fire, if one intends to determine whether there is causal dependence between the short-circuit and the house fire incident, one can apply these conditionals to the case and determine the truths of these conditionals, it follows as:

(a) short circuit □→ fire incident

(b) ¬short circuit □→ ¬fire incident'

In conditional (a), the short-circuit and fire incident take place in actuality, and as stated earlier, each world is the closest to itself, which means this actual world is the closest to actuality, so it is true that the short-circuit possible world is also the fire incident possible world. Therefore, conditional (a) is true. As for conditional (b), in order for it to be true, there needs to be the closest possible worlds where every condition is exactly the same as the actual world except that the electrical short-circuit does not take place. In this scenario, Lewis holds fixed the laws of nature, given in terms of refularities, and so notes that in the nearest world to ours in which the short circuit didn't take place is a world in which the fire doesn't take place. He thus believes that without the short-circuit, the fire incident would not have taken place, and correspondingly, conditional (b) is true. Lewis then draws the conclusion that the fire incident is causally dependent on the electrical short-circuit. On the face of it, it seems as if Lewis successfully explain causal dependence in terms of counterfactual conditionals, and so given a full account of causation.

Nevertheless, I do not agree with Lewis on his account of conditionals (a) and (b) examined in the last paragraph. To be more specific, conditional (a) is clearly true, yet conditional (b) should not be left alone so soon. As mentioned above, if it were not for the electrical short-circuit, the house fire *might* still happen, one simply cannot deny the possibility of it, because there are also some possible worlds where there is not a short-circuit but instead someone lights up some fireworks near the house which causes the fire incident. In this case, the fire incident still happens without an electrical short-circuit. Notwithstanding, the possibility that other factors might have been the cause of the fire incident instead of the electrical short-circuit does not affect Lewis' argument that causal dependence between actual events is sufficient, but not necessary.

That being said, there are two important objections against Lewis' account of causation I intend to discuss here. Firstly, I would like to address the same obstacle that Mackie's theory (1965) fails to overcome, that is*, the theory of context-sensitive*. Take the house fire case again for an example, there being oxygen in the house is an INUS condition for the fire incident, which entails that there is also a causal dependence between the fire and oxygen in the house, in other words, one can say that the fire is causally dependent on there being oxygen in the house, if there were not any oxygen, there would not have been a fire. In short, the theory of context-sensitivity suggests that 'causation is an absolute relation whose nature does not vary from one context to another.' (Menzies, 2017) To be more specific, recall Lewis' account: if the cause *c* had not happened, then the effect *e* would not have taken place. To this the advocate of necessary causal connection replies by saying that if the cause *c** had happened instead of *c*. then the effect *e** would have happened instead of *e*. And it seems that the argument has reached an impasse now.

Lewis acknowledges this concern and in reply he states that:

> [W]e haven't made up our minds: and if we presuppose sometimes one answer and sometimes another answer, we are entirely within our linguistic rights. This is itself a big problem for a counterfactual analysis of causation... (2000: 186)

Clearly, this is not an satisfying answer to the question. However, I think the reply to this concern can be established in a better form. Firstly, since to make a decision on a causal relation is *entirely within our linguistic rights*, it entails that it is our mental perception that has the determining power over such relation, which indicates that such causal relation is still mind-dependent. Secondly, the rival of the counterfactual analysis claims that if the cause *c** had taken place instead of *c*, then the effect *e** would have happened instead of *e*, but this attempt to argue for necessary connection looks absurd to me, for *e* or *e** or *e*** or even *e**** would have randomly happened as the effect of the cause *c* or *c*** or *c*** or even *c****. What I am trying to say is that there is a possibility that the cause c could also have caused the effect *e** or *e*** or even *e****, there is no guarantee that the cause *c* can only generate the effect *e* when it is possible for it to cause other effects, such as e*, or e**, and this list can go on endlessly, the point being made here is that it is up to our minds to decide what the cause actually is, and it directly entails mind-dependence of causation. Therefore, this objection is moot.

Finally, in this section, it is worth once more considering the status of laws of nature on Lewis's view. As his is a Humean view, he does not consider the laws of nature to be fundamental facts about a world, but rather they supervene upon the regularities that hold. He is a B-theorist eternalist, and as such, the past, present and future exist and form the subvenient base upon which the laws supervene. In short, if

there are, as a matter of fact, fundamental regularities that hold across the entire span of spacetime within a world, then those regularities constitute laws of nature. Of course, I have rejected B-theory eternalism (and A-theory eternalism, i.e. the moving spotlight view, too). And as we shall see in the next chapter, it is the issue of how to combine a Humean view of causation and law with the growing block issue that will concern us.

Section 6: Dispositional Analyses of Causation

We have been driven to a Humean account by a consideration of Hume's argument that we cannot account for existence of necessary connections in the world. We have already rejected Mackie's objection, and seen that the Humean view can be developed in an elegant and convincing way in a Lewisian fashion (except, of course, that he develops it within an eternalist framework). But before I finish I will discuss one further attempt to reject the Humean view. This rejection comes from the powers theory of causation, which derives from medieval philosophical discussion and is embraced mainly by Jacobs (2010), Mumford and Anjum (2010) in the contemporary philosophical debate.

According to this theory, there certainly is some kind of determining power between a cause and its effect that should be considered as a natural phenomenon even if this power is not necessary connection. To be more specific, there are two important features of this theory that make it a rival of Hume's or a Humean empirical view of causation, one is that instead of causal necessity, it is dispositionality of a cause that exists within a causal relation, and the other is that such dispositionality cannot be reduced to causal necessity. In other words, 'Causes do not necessitate their effects: they produce them but in an irreducibly dispositional way.' (Mumford &

Anjum, 2010: 143) Furthermore, regarding the notion of constant conjunction derived from Hume's argument, the advocate of the dispositionalist view disagrees and claims that such a view is problematic for the reason that 'there can be accidental cases that were not genuinely causal,……[and] a true dispositionalism… is one in which a cause only tends towards its effect.' (Mumford & Anjum, 2010:144)

Moreover, the dispositionalist distinguishes general causal claims from particular causal ones. For example, according to Mumford & Anjum (2010 144), the dispositionalist argues that, in general causal claims, smoking cigarettes causes cancer, and there does not need to be any constant conjunction for this causal relation; however, in particular causal claims, even if smoking cigarettes caused cancer, it does not necessarily entail that it is this cause that necessitated cancer, instead, it could be something else that actually caused it. To be more specific, for general causal claims:

> [A] cause should be understood…… as something that disposes towards a certain effect or manifestation…… [and] In many particular causal claims, however……. A cause is something that disposes towards an effect and succeeds in producing it. (Mumford & Anjum, 2010: 144)

My understanding of the description of this distinction is that a cause is supposed to have some kind of properties that has the determining power as to how the effect will turn out to be, and such determining power forms the causal disposition from a cause towards its effect.

What is more, with regard to how this dispositional causation functions, the dispositionalist offers an explanation known as the threshold theory, which entails

that ‘an effect occurs when its causes have accumulated to reach the requisite threshold.’ (Mumford & Anjum, 2010: 145) And this threshold can be explained in terms of powers. In short, with this threshold theory explaining causal relations, the dispositionalist argues that without constant conjunction or necessary connection, there can still be causal relations, and accordingly, Hume is wrong to suggest that there is only constant conjunction.

Conclusion

I find this view utterly puzzling, for a very simple reason. Powers theorists claim that they can do without the notion of necessary connection. And yet, as stated above, in order to explain the dispositional nature of powers they maintain that a power operates to produce an effect when its causes have accumulated to reach some threshold. However, what does this mean if not that once that threshold has been reached, the effect follows with necessity? I simply cannot see what else it can mean except for this, and so I cannot understand why they think their view does not involve necessary connections. For this very simple reason, then, I conclude that the powers theorist does not provide an alternative non-Humean account of causation.

Chapter 7

Combining the Growing Block View with the Humean Theory of Causation and Law

Introduction

Having accepted the growing block view of time, and a Humean account of causation and laws, in this chapter I will examine how we might combine them. I draw upon the work of Benjamin Smart (2018), who is, so far as I have been able to determine, the only person to have attempted such a combination before. In section 1 I outline his argument, the NOLAW argument, which is supposed to provide a set of problems for the growing block Humean (or, as Smart calls the view, “no future Humeanism”). In section 2 I consider Smart’s own solution, Hypertemporal Humeanism. In section 3 I then signal my agreement with some of what Smart says about how his view solves the problems given by the NOLAW argument. Then in section 4 I criticise Smart’s view, discuss how Humeanism should be combined, and provide my own alternative account of how the growing block view, namely, the theory of potential laws. Finally, in sections 5 and 6 I make some more speculative comments, which I hope to develop further in future work. And that will lead me to the conclusion of my thesis.

Section 1: Smart's NOLAW argument

However, before I undertake the task, it is necessary to have a discussion over a different approach recently advanced by Benjamin Smart (2018), for I believe that although his approach does cast a new light upon the current debate, it is in fact problematic, and by demonstrating the problems with it I will argue that my alternative solution for the growing block view can overcome them.

According to Smart (2018: 99), there are four doctrines that necessarily constitute what he calls 'open future Humeanism': the first one is that truth supervenes on a four-dimensional block of local particular states of affairs; the second doctrine is that there is no such thing as necessary connection between temporal events; the third is the familiar notion that there is a privileged dynamic present; and the last one is that there is an absence of future facts (i.e. that they have indeterminate truth-values until they are actualised). As should be clear, the view I have argued for in this thesis has all of the features, and so my view is an open future Humean view.

Regarding these doctrines, Smart (2018: 99) points that if there is an absence of future facts, then some have thought that the Humean theorist is unable to either provide laws of nature or validate our ordinary inductive inferences from the external world. This is said, according to Smart, because the Humean notion of laws suggests that all truths supervene on an *omnitemporal* block of local particular states of affairs (i.e. of the sort the eternalist thinks there is). Drawing upon Hutterman (2014) Smart outlines the argument that is supposed to cause problems for no future Humeanism:

NOLAWS

P1. The explicans for uniformities in nature allow one to make inductive inferences.

P2. The only explicans for uniformities in nature are natural laws.

P3. The Humean requires a complete supervenience base in order to provide nomological facts about a world w.

P4. According to open-future Humeanism, w is incomplete, as w's supervenience base ends with the objective present moment.

C1. There are no nomological facts about w for the open-future Humean. (P3, P4)

C2. Open-future Humeanism can provide no explanation for uniformities in nature. (P2, C1)

C3. The open-future Humean cannot justify inductive inferences. (P1, C2)

(Smart, 2018: 101)

Smart goes on to outline the key concepts that feature in this argument. According to the Humean view, 'worldly facts are determined by a four-dimensional mosaic/block of fundamental property instantiations, and the fundamental spatiotemporal relations between them.' (Smart, 2018: 99) That is to say, laws of nature do not play a significant role in determining the patterns of fundamental property instantiations. Instead of that, it is the patterns of fundamental property instantiations that have an upper hand in determining the laws of nature. Moreover, the Lewisian Humean theorist holds a view that 'all facts about the universe are fixed by a complete supervenience base: a four-dimensional mosaic comprising every event that will ever be.' (Smart, 2018: 100) If this is true, then it is clear that this view is a closed-future

view. Furthermore, the Lewisian theorist also believes something similar, that is, that 'all contingent propositions (including future contingents and natural laws) have determinate truth-values.' (Smart, 2018: 100) All of these concepts were outlined and explained in the previous chapter where we saw how Lewis develops his Humean view.

It is because the Lewisian way of developing Hume's view has been seen as the standard way of developing Humeanism, i.e. in eternalist terms, that the NOLAWS argument gains traction. As soon as one moves to an open-future (i.e. growing block) view a problem instantly arises with explaining the supervenience of the laws on future facts and events, for the open future theorist holds the view that the future is not fixed and the truth-values in future events are indeterminate. In other words, as above-mentioned, not only is the Humean incapable of determining how future events will unfold. More importantly, according to Smart (2018), if the supervenience on future facts is absent, then it entails that there is a missing component of the supervenience base required for explaining nomological truths. As Hüttermann (2014) argues, the growing block view seems to entail lawlessness if applied to the Humean view. This problem is the main component of the NOLAW argument, as primarily advanced by Hüttermann (2014), and it is this very problem that the proponent of the growing block view needs to overcome in order to establish a strong and complete ontology.

Section 2: Smart's Hypertemporal Humeanism

Reflecting upon the above, it is clear that a legitimate growing block view with an ontology of the open future is obliged to explain and clarify three aspects of the

current debate, the first is that there needs to be an explanation as to what laws of nature actually are if there are any at all; and the second aspect is that it requires an answer to the question of whether anything can supervene on non-existent future facts if not laws of nature; and the last one is that given the open future, it is necessary to explain what nomologically guarantees that worldly facts will remain the way they have held in the future. With the Hypertemporal Humean view, Smart (2018) attempts to explain exactly these three features. However, this approach to an ontology of the open future is also considered tentative for it compromises certain Humean features in order to overcome the objections embodied in the NOLAW argument, and I think it is likely that such compromise is one step too far and ends up paying an ontological cost too high.

Here is the view of Hypertemporal Humeanism as Smart defines it:

> All truths (including nomological truths) at a time t supervene upon the mosaic of local particular matters of fact, and the spatiotemporal relations between them, in the hypertime at which t is (temporally) present; that is, where t is on the brink of the block. (Smart, 2018: 103)

Explicitly stated in the description, this approach allows all truths to supervene on all times up until the edge of the hypertemporal present (i.e. the edge of the growing block), and also grants that there is a whole and complete supervenience base for the existing facts within the spectrum of the hypertemporality, which means that future facts are not included in the supervenience scope, and therefore are not necessary for nomological truths. Accordingly, this answers C1 of the NOLAW argument. It does so by rendering future facts unnecessary for nomological truths. In

exchange, this approach adopts a slightly modified version of the Humean view According to the standard Humean view, there laws of nature are the regularities that have held up until now and *will continue to hold in the future* (whether or not we know they will). These are defined in terms of regularities, as we have seem instead, which take the canonical form of all Fs are Gs *(∀x(Fx→Gx)*). Compared with this, Smart puts a limiter on the modified version of the Humean view, that is, that '*All Fs are Gs until t*' (Smart, 2018: 106), and the *t* represents the edge of the hypertemporal block, which is the present.

Now, the fundamental feature of Smart's Hypertempral Humeanism that I will shortly take issue with is his claim that laws of nature only hold up until the current moment. The view entails that, if has thus far (in 2019) been true that all Fs and Gs, then it is a law that All Fs and Gs until 2019. But, if in the next instant a a non-G F comes into existence, it will not be a law that All Fs are Gs until 2020. The question I will pose regarding this, is: have, therefore, the laws changed, or have they not? As we will see, Smart's view faces some difficulties in answering this question.

Furthermore, the fact that the Hypertemporal Humeanism has difficulties in providing a satisfactory answer to this question is exactly where I believe I can make a breakthrough, by adopting the theory of potential laws. As described above, the C1 of NOLAWS states that there are no nomological facts about w for the open future Humean, but I do not believe that this is true, and therefore, I reject this conclusion. More precisely, I think this conclusion is false because one of its premises is false, and that is P4, which states that according to open-future humeanism, w is incomplete, as w's supervenience base ends with the objective present moment. In my argument, there are nomological facts about w, because the supervenience base is actually complete, and it is the potential laws that guarantee that the worldly facts

will in the future remain the way they have been. But before I come to this discussion in more detail, I wish to consider his treatment of C2 and C3, with which I am in agreement.

Section 3: Smart's Treatment of C2 and C3

Smart makes short work of C2 and C3, and I agree that he should. First, with regard to C2, the claim is that open future Humeans cannot explain the uniformities in nature. His answer, in short, is: nor should they! He argues that any view that allows us to explain such regularities is not a "true-to-Hume" view because (and as we have seen in the previous chapter) Hume does not think that the laws of nature explain the regularities at all. Rather, the regularities explain the laws of nature (this is because the laws supervene on the regularities and not the other way round). (Smart, 2018: 106) A similar story applies to C3. According to to the objection, the no future Humean cannot justify indution. And Smart's answer, again in short, is: nor should they! As he explains (and again as we have seen in the last chapter) Hume does not think that induction can be "justified" (if that is taken to mean rationally justified), because Hume thinks reason is not strong enough to do so, and instead he rests content with explaining our *practice* of using inductive inferences via custom and habit. So, once more, if any account of the laws of nature were to justify induction, it would not in the end be a "true-to-Hume" account.

As I have said, I am in complete agreement with this aspect of Smart's view. As a consequence, I take it that in criticising his view further, and developing my own version of open future Humeanism, I have no reason to answer C2 and C3 either. However, C1 still poses a serious issue.

Section 4: Potential-Laws

I now return to the question I posed earlier. According to Smart, canonical laws of nature are of the form “All Fs are Gs until t”. Now, we supposed earlier that until 2019 it has indeed been true that in the universe all F’s have been Gs, but that it will happen that next year a non-G F will occur. On Smart’s view, then, in 2019 it will be a law that “All Fs are G until 2019” but that in 2020 it will not be a law that “All Fs are G until 2020”. My question was: have, therefore, the laws of nature changed, or not? Now, Hume himself never explicitly considered whether the laws of nature can change, but his implicit position was they cannot. This is because his implicit view, as mentioned, is that the laws of nature are those regularities that have held up until this point and that *will continue to hold in the future* (whether we know they will or not). And so, on Hume’s view, if “All Fs are Gs” were true up until 2019, although we might think that this *is* a law of nature (again, due to custom or habit), when in 2020 a nonG F occured, we would then have to admit that it not only isn’t a law of nature in 2020, but that it *never was* a law of nature at all. But Smart himself cannot allow this. This is because on his view, it seems, when 2019 is present he must say it *is* a law of nature that “All Fs are G until 2019”. And in fact, the fact that when 2020 comes along and a non G F occurs, does not stop this from being a law of nature, for it is still true in 2020 that “All Fs are Gs until 2019”. And so, it seems, Smart must admit that laws of nature are all of them relative to times. That is, there is one set of laws that are true relative to 2019, and another set relative to 2020, and so on.

Indeed, if “All Fs are Gs until 2019” is a law, when it was 2018 it would have ben true that “All Fs are Gs until 2018” was a law. But, this law, as it contains the temporal qualifier 2018, is a distinct law from the later law that contains the temporal

qualifier 2019. As such, Smart is committed to there being a different set of laws *for every moment of time*. Each of these sets of laws comes into existence as the time it refers to does ("All Fs are Gs until 1999" came into existence in 1999 when this year came into existence, "All Fs are Gs until 2000" came into existence in 2000 when this year came into existence, and so on). But each of these laws will continue to hold no matter what happens in the future too, for nothing that can happen after a certain time t can have any influence over what happened until t.

All of the above is quite difficult to square with Hume's view itself. After all, Hume did not think that there were laws that are relative to times, or that laws could continue to hold even if the regularities they mention cease to hold (for, on his view, then they wouldn't have been a law at all). So, Smart's view turns out not to be as "true-to-Hume" as he thinks it is. In what follows I develop an account that I believe is truer-to-Hume's.

My basic idea is that, if the growing block view is true, then because the future has not yet happened, we should not admit that there are *any* laws at all. Now, Hume himself never considered the open future, or the idea of there being a growing block. But it seems likely that if were to accept that there are no facts about the future, i.e. that it is alethiclly open, then he would have admitted that there is no truth about whether any regularity *will* continue to hold or not either. And as a consequence, he would have held no regularity that has occured up until now can possibly *be* a law.

Of course, the above does not prevent us from defining a weaker notion, something that we might call a 'potential-law'. A potential-law, as we might think of it, is a regularity that has held up until the current moment, and so can supervene on the four dimensional mosaic that currently exists (i.e. up to the edge of the growing block). It might then be that "All Fs are Gs" is indeeed a potential-law, even if it is not

law. We do not want to build any temporal qualifiers into these potential-laws because we will want to say that the if a regularity has held up until the current moment, then the very same potential law has held up until now. However, what we will want to say is that, if the regularity breaks down, and a non G F occurs (again, say, in 2020), then the potential-law will break down at that point to. Thus, we will say:

> A statement of the form “All Fs are Gs” is a potential law at t iff all Fs have been G up until t.

That is, we build the temporal qualifier not into the statement of the potential-law itself, but into the conditions of its holding. This will then enable us to say that “All Fs are Gs” was a potential-law from the beginning of time up until 2020, when it stopped being a potential-law.

That, then, is my proposal. I believe this account, in terms of potential-laws, is a genuine “true-to-Hume” account of the laws of nature, for if Hume had accepted the open future, he would have denied that the regularities that have held up until this point count as being laws at all. But, it still enables us to recognise the importance of regularities in our causal thinking. There are single potential laws that hold until the regularities they embody break down (if they do break down). The potential-laws supervene on the currently existing extent of the growing block, and do not require there to be a more extensive subvenient base.

Moreover, as above mentioned, Lewis (1973: 75) defines the theory of counterfactuals by saying that it is a matter of comparative similarities. More precisely, one world is considered to be closer to the actual world than the other if

the first world shares more similarities with the actual one than the second. That being said, by adopting the concept of potential laws to the discussion of temporality, it enables one to also explain how we measure closeness of possible worlds the way Lewis would intend, and so it is consistent with his account of causation in terms of counterfactual conditionals. And finally, if the end of time ever comes, and a regularity has held throughout all of time, then a potential law will finally become a genuine law, in agreement with how Hume thought of them.

That completes my discussion of my positive view of how to combine the growing block view with Humeanism. Before finishing, in what follows I discuss some further issues in light of this proposal in a more speculative manner.

Section 5: the Big Bang (and Before)

I start this section by asking: what were the potential-laws before the Big Bang, if there were any? In fact, there might not be any of nature itself at all before the Big Bang happened. Nowadays, we know that there are four general forces existing in nature: gravitational, electromagnetic, weak and strong nuclear forces, which are believed by many to be the fundamentals of this world, but it looks highly possible that before the Big Bang there were not any of those forces. Subsequently, there was the happening of the Big Bang, and space and time thereafter came into existence. There are two points to be made here, one is that the Big Bang was a singular event or even an accident, so it should not be considered as part of any potential-laws; the other is that there was a shift in the state of nature from void or nothingness to the existence of particles, which means that the potential-laws only

started existing at some point. Accordingly, there is an asymmetry. A potential-law can cease to be a potential-law if it fails to hold in the future, but it does not fail to be a potential-law if it fails to hold in the past, so long as it has held since potential-laws came into existence.

As to this statement, some may disagree and claim that if neither potential-laws nor nature existed before the Big Bang, then there were not regularities in nature either. I partially agree with this statement, but this does not do any harm to the existence of regularities in nature since then. That being said, there could be regularities in the state before the Big Bang - regularities in some kind of void or nothingness, that demonstrated the way that kind of void was. Perhaps the regularity here was “No Fs are Gs (or Hs, or Js, etc.)” Then, we are perhaps best positing epochs of potential-laws. This was a potential laws until the Big Bang, whereby a new epoch of potential-laws came into existence.

Now, since regularities allow singular accidental events to take place, thus it can explain the happening of the Big Bang without having to appeal to causation, after which, there has been a different set of regularities that demonstrate the way the current universe is. Also, these regularities may well will stick around as long as this universe exists. Following this line of reasoning, space and time are the two most fundamental components of the universe, that is to say, the regularities that demonstrates the way time and space are in this current universe will exist as long as time and space exist, in other words, the existence of spatiotemporality is potential-law in itself.

Section 6: More on the Growing Block View and Necessary Connections

With the enquiry of why laws of nature are reducible to regularities in nature thoroughly answered, it is time to get the growing block view back in the picture. I believe that not only is it necessary to combine the growing block view with the Humean view of causation, it is also a more convincing explanation for the supervenience base for future facts as the temporal block expands. But before investigating this approach, I would like to briefly go through the approach of laws of nature in order to make clear of why exactly it is not worth giving regularities in nature up and taking necessary connection in.

As discussed in the last chapter, when adopting necessary connection to our ontology, a problem arises in terms of the explanation of accidents or non-causal chain of events. To be more specific, on the cause end, one can never be sure what a cause actually is for the effect to happen, take the house fire caused by the short-circuit of electricity for an example, the connection between the short-circuit and the fire is sufficient not necessary, it could have been some other causes, such as fireworks being lit up outside the house. There is always a randomness or openness in such relations. On the effect end, there is no such thing as absolute necessity between a cause and effect, even if regularities hold, for there could always be some unforeseen factor playing a sufficient but unnecessary role in the process of a causal relation, and the outcome is different from the empirical ones obtained before regardless of how small the chances are. Mental events, for example, can be completely non-causal at times. One does not need other mental events as a cause to have a specific mental event.

Furthermore, when one refers to laws of nature, automatically there is always a sense of permanency or even of reliability in such terms, as we tend to believe these laws have never changed and will never change. But I believe that this is *actually* not the case, i.e. I believe that the potential-laws *will* break down at some point. And so if there are no permanent laws of nature, then they cannot be considered as the permanent standards for how the universe functions. The fact that the Big Bang was the start of the universe indicates that there was a different state before the Big Bang, that means there was a fundamental shift of states before and after the event, which by the way was also a singular accident.

In short, the no laws of nature can have existed before, and if they did not get to determine the way the universe was, then there is no reason to have the belief that they get to determine the way the universe is now. In some sense, even the universe may be temporary, for there was indeed a start and it is always possible that there will be an end. Accordingly, no law of nature can possibly be as reliable as it appears to be after all. I think it is clear now that it is not worth adopting laws of nature just to avoid a problem with regard to the supervenience base for future facts, which can be solved by the Regularity Theory. This leads back to the discussion why the Humean view is a better option for the growing block theorist to escape the supervenience dilemma.

Recall the three conditions for a causal relation stated above, according to the Regularity Theory, C causes E if and only if there is a regular association between things similar to C and things similar to E, and C happens before E, and there is a spatiotemporal continuity between C and E. Despite that there is no necessary connection involved here, these three conditions suffice for a causal relation to take place. The problem the growing block theorist is obliged to overcome is the

supervenience base for future facts as temporal block expands into the future territory. In this regard I think it may be possible to defend the idea that regularities in nature can make worldly facts remain the way they are at the edge of block without necessary connection being involved in the process. There are three main reasons I would like to discuss here to show the Humean view can actually lend a helping hand to the growing block theorist. The first reason is that the Regularity Theory is ontologically more parsimonious than laws of nature; the second reason is that regularities in nature have the existence of time and space as their existential foundation; and thirdly, regularities ensure the openness of the future.

As discussed in the last chapter, every participant of this debate, the necessitarian, the power theorist, and the dispositionalist theorist, has attempted to establish some kind of guaranteed connection between a cause and its effect. Nevertheless, the defect that commonly exists in all their arguments is that with such connection comes a heavy ontological redundancy. It is so for two reasons, one is that there needs to be an explanation in terms of what triggers singular events and accidents to take place in the first place, if necessary connection between a cause and its effect is considered as fundamental; and the other is that there can be a whole set of numberless causes for a single effect to happen, every single cause of the set is a sufficient but not necessary condition, to identify the causal relation between a specific (and sometimes unobservable) cause and an observable effect is an unnecessarily expensive price to pay.

Furthermore, Even if such causes could be identified (which I do not think is true), an explanation is instantly required for what it is that determines a causal relation take place in a certain way, if such determination is causal powers, then there is a need to explain what guarantees such powers and why they are not

reducible to dispositions; and also, if such determination is disposition, then it is necessary to explain why dispositions are not mind-dependent because they certainly appear to be.

Compared to these views of causation, Hume's Regularity Theory elegantly avoids these explanations by stating that there are only so many essential regularities in nature, we can experience and observe how they cooperate with one another in different environments but such cooperation is purely contingent since it can be reduced back to essential regularities. Nevertheless, regularities in nature are able to ensure causal phenomenon in nature while still preserve some room for accidental and singular events with a more economical theoretical structure.

Specifically speaking, I think there are presumably three different states of the universe, the first is the state of 'pre-existence', which is probably void or nothingness, as described above. Also, in such state there is a singular regularity, because nothingness itself is a regularity. Then, an accident known as the Big Bang turns this nothingness into an existence of the universe with space and time in it, and regularities with regard to the spatiotemporality are generated simultaneously. During the course of the universe, the existence of time and space assure regularities in nature, which means that, unlike laws of nature, to explain what is going on in this universe is these regularities' only responsibility, the concerns as to the states before and after the existence of the universe are not questions for which regularities in nature need to provide answers.

Thirdly claiming that there is a third state is a risky but sensible proposal, it is unlikely the *forever* expanding universe will *ever* end, but it is always plausible that at some point it may stop expanding and cease to exist, but such is not a worry for regularities in nature, because if that actually happens, there will be a different set of

regularities to explain the way that state is. Furthermore, in this universe, as long as time and space exist, regularities in nature exist, and according to the Regularity Theory, there is a causal relation between C and E when things similar to C and things similar to E happen in the right temporal order and a spatiotemporally continuant way, so in other words, the existence of time and space guarantee that causal relation C and E will remain the same. This leads to the second reason the Humean Regularity Theory is better approach.

The problem that causes the growing block theorist's struggle is to justify that there is a supervenience base for all nomological facts, when future facts are non-existent and therefore have indeterminate truth-value. I argue that this will no longer be the case when appealing to the Regularity Theory, according to which, the existence of time and space is the supervenience base for all truths. To be more detailed about this, all the temporal relations between events within the block are fixed, and these fixed relations are the evidence that, empirically speaking, if things similar to E have always spatiotemporally followed things similar to C in the past, and as long as the spatiotemporality stays the same, these causal relations will always stay the same at the edge of the dynamic present.

Furthermore, some believe that Hume personally accepts some of laws of nature, but in his theoretical works he seems to be very persistent on denying necessary connection all together. However, this does not mean that he denies that there can be a sort of reliability ('tendency' would be a strong term for it vaguely implies necessity to some extent) within a causal relation, because :

Yet [Hume] does not deny the sufficiency of the cause.....more subjectively.

> He does not deny that the cause is a sufficient condition for its effect in the sense that such effects do always follow... (Bigelow & Pargetter, 1990: 91)

I think it is not hard to explain this reliability or the sense in which such effects do always follow, it is regularities in nature that allow this reliability to exist in a causal relation from the cause towards its effect, since regularities are co-existent with time and space, and if spatiotemporality exists, then these regularities about them exist; and if these regularities exist, then this reliability exists. Therefore, this reliability is purely contingent based on the existence of time.

Since one of four tenets of the growing block view states that 'there are no future facts; that is, contingent propositions about the future obtain truth value only when their referents are actualised.' (Smart, 2018: 99), the concern about this is that the Humean view is unable to either provide laws of nature or validate most common inductive references. Worse than this is the worry that regularities may stop holding at any time. In response to these enquiries, I think it is true to say that regularities may stop holding at any time, there is no doubt about it. However, that does not mean that the Humean view cannot provide potential-laws, as I have outlined, and *explain* our daily inductive inferences.

Conclusion of Thesis

This concludes my thesis. I have argued for the growing block view of time, and a Humean view of causation and law. I have then showed that they can mesh together

in a satisfactory way via the notion of a potential-law. In this chapter (in sections 5 and 6) I have also entertained some more speculative ideas, that I hope to pursue further. But, for now, I am content to have provided what I consider to be a strong case for a unified view of time and causation. The onus, at least, is certainly upon my opponents to show where my view goes wrong.

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