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Further Themes from Prior, Vol. 2

Blackburn, Patrick Rowan; Hasle, Per; Øhrstrøm, Peter

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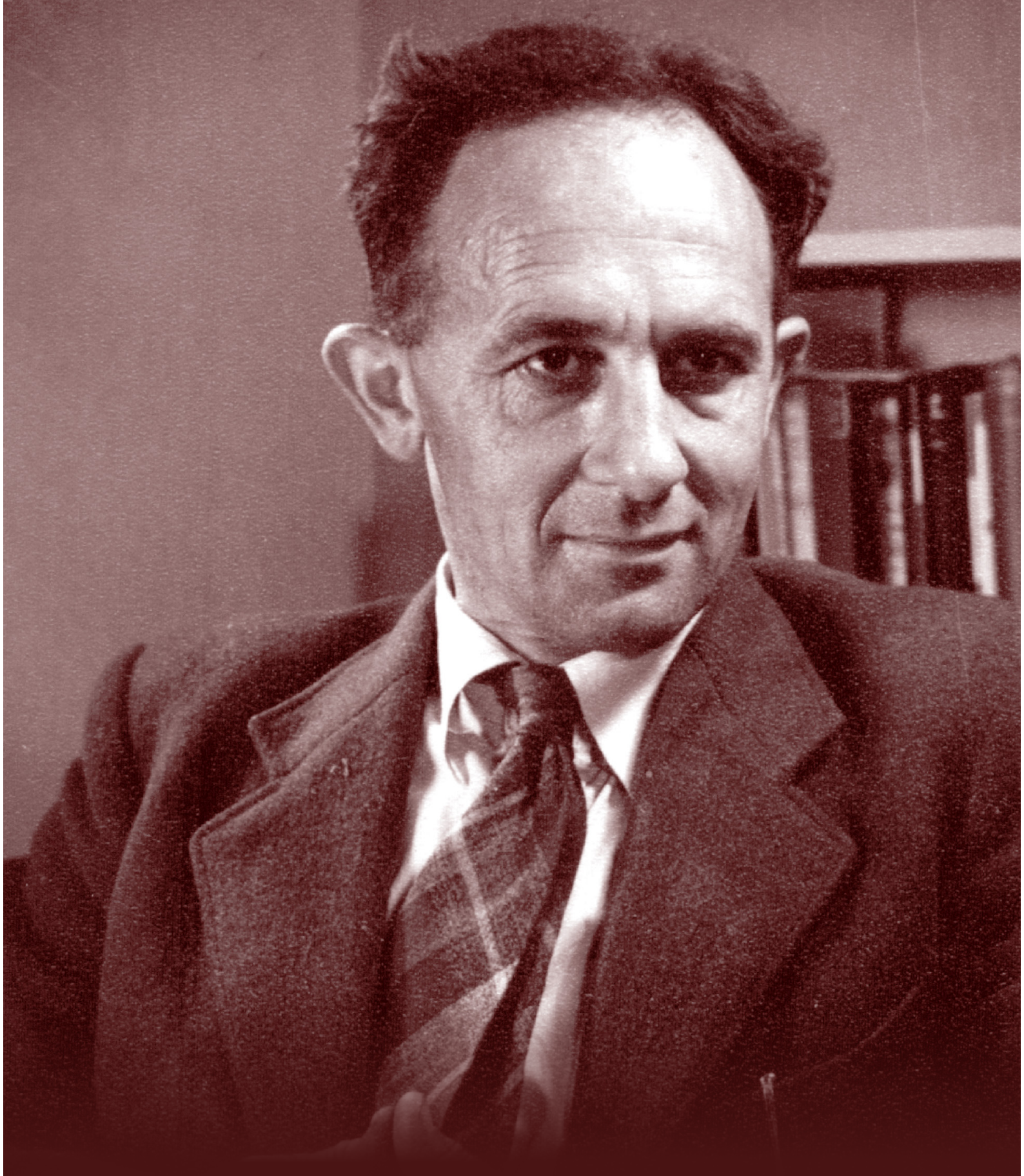
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Logic and Philosophy of Time
Further Themes from Prior, Vol. 2

Patrick Blackburn, Per Hasle and Peter Øhrstrøm (Eds.)

Logic and Philosophy of Time

A.N. Prior (1914-69) in the course of the 1950s and 1960s founded a new and revolutionary paradigm in philosophy and logic. Its most central feature is the preoccupation with time and the development of the logic of time. However, this was inseparably interwoven with fundamental questions about human freedom, ethics, and existence. This remarkable integration of themes also embodies an original and in fact revolutionary conception of logic. The book series, *Logic and Philosophy of Time*, is dedicated to a deep investigation and also the further development of Prior's paradigm.

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- 2 - Logic and Philosophy of Time: Further Themes from Prior. Edited by Patrick Blackburn, Per Hasle, and Peter Øhrstrøm.

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Edited by Patrick Blackburn, Per Hasle & Peter Øhrstrøm

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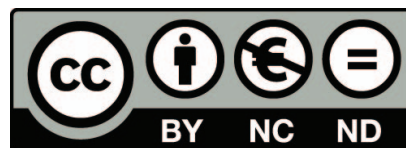
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Presentism and Cross-Time Relations

R.D. Ingthorsson

Lund University and Linköping University, Sweden

rognvaldur.ingthorsson@fil.lu.se

Abstract

This paper is a partial defence of presentism against the argument from cross-time relations. It is argued, first, that the Aristotelian view of causation and persistence does not really depict these phenomena in terms of relations between entities existing at different times, and indeed excludes the possibility of such cross-time relations obtaining. Second, it is argued that to reject the existence of the past—and thereby be unable to ground the truth of claims about the past—does not lead to any absurd consequences.

Keywords: Presentism, cross-time relations, grounding objection, causation, persistence.

1 Introduction

Presentism—the view that only the present exists, the future not yet, the past no longer—is currently a focal point of contemporary philosophy

of time. It is still by no means the favoured view, and yet undeniably an equally hot topic among those who promote it (see, for instance, Crisp 2005, [10]; Bourne 2006, [4]; Markosian 2004, [22]; Ingthorsson 2017, [17]), and those who oppose it (see for instance, Oaklander 2010, [26]; Mozerky 2015, [24]; Torrenco 2017, [34]).

I am not entirely sure why presentism is getting all this attention. It may be related to the growing realisation that presentism is immune to *McTaggart's Paradox* and *the problem of temporary intrinsics* (Craig 1998, [8]; Cameron 2015, [6]; Ingthorsson 2016, [16]) and therefore emerges as the most promising version of the *A* view of time. As a consequence contemporary philosophy of time gravitates towards presentism, and in particular its weak spot, which is undeniably the *problem of cross-time relations* (Bigelow 1996, [3]; Crisp 2005, [10]). I suspect that a contributing factor is also a growing dissatisfaction with the *B* view of time, i.e. its failure to convincingly accommodate for enduring particulars and more generally to account for the dynamic features of experience (Prosser 2016, [28] is possibly the best attempt yet).

The *argument from cross-time relations* goes as follows. If the future/past do not exist, then relations popularly believed to hold between the present and the future/past, do not exist either. Since cross-time relations have come to figure centrally in the formulation of a range of metaphysical notions, like *causation* and *persistence*, and metaphysical cum semantic relations such as *truth* (albeit only the truth of propositions about the past and future), truth being central to our understanding of *knowledge*, then presentism is taken to entail the absurd conclusion that there is no causation, nothing persists, no claims about the past/future are true, and therefore we have no knowledge of the future/past.

The argument from cross-time relations would be a *reductio ad absurdum*, if presentists were unable to offer viable alternatives, but they can. In this paper I will first present contemporary versions of presentism and how they propose to deal with the problem of cross-time relations (Section 2). Then I will paraphrase what I have argued elsewhere, notably that a presentist can accept that there can be no true propositions about the past and future, and yet argue that we can have justified belief about the future and past (Section 3). Whether that is enough for having knowledge, is a controversial issue, but it seems to me that this already is a controversy even for that part of temporal reality whose ex-

istence we all agree about—the present—and even if it be assumed that the future and past exist in parity with the present. The controversy, briefly, is that if knowledge is assumed to be fallible, then this is to assume that beliefs about the world can count as knowledge even if they are false. If only those beliefs count as knowledge that are actually true and justified, we have decided to confine the sphere of knowledge to things that are infallible.

Finally, I will argue that the presentist can easily provide an alternative account of causation and persistence, one that does not involve cross-time relations (Section 4). They need not invent one from scratch, because they can make use of the old Aristotelian conception of causation, which did not represent causation as a two-place, cross-temporal, relation. Indeed, most neo-Aristotelian powers-based accounts—which depict causation as the production of change through the interaction of powerful particulars—are already viable presentist accounts of causation (Ingthorsson 2002, [14]).

2 Presentism

In the contemporary literature, presentism is seldom described by more than a single phrase such as ‘only present objects exist’, or ‘existence is confined to the present’, before the discussion turns to the problems of upholding that belief. Authors often make up for the brevity of their presentation by appealing to the reader’s intuitive understanding of the thesis, claiming that the confinement of existence to the present is a part and parcel of the lived experience of every human being (Bigelow 1996, [3]).

Nevertheless, one can discern a number of alternatives, all of which arise from concerns about the reference and truth of expressions about the future and past. Indeed, all of them deploy what I have elsewhere called the *relocation strategy*; to argue that the entities we naively believe to be in the past or future, are actually in the present (Ingthorsson 2017, [17]). I will focus on the past, since the lack of truth-values for past tensed expressions is a much greater problem than the lack of truth-values for future tensed expressions.

GLOBAL PROPERTY PRESENTISM

One version of presentism, sometimes called *global property presentism* (Kierland 2013, [20]), is usually traced back to Arthur Prior's suggestion that claims about the past, even those that have the grammatical structure of singular statements, do not refer to any particular existing state of affairs, but to some general feature of the world as it is now:

the fact that Queen Anne has been dead for some years is not, in the strict sense of 'about', a fact about Queen Anne; it is not a fact about anyone or anything—it is a *general* fact. Or if it is about anything, what it is about is not Queen Anne—it is about the earth, maybe, which has rolled around the sun so many times since there was a person who was called 'Anne', reigned over England, etc. (Prior 1962, p. 13, [27])

Please note that by 'fact' Prior means something like true proposition, while whatever facts are 'about' refers to the existent state of affairs that makes that proposition true. Anyway, for Prior, facts about the past constitute the set of beliefs that are putatively true and thus in need of truthmakers. The problem is that the past does not exist, according to Prior's presentism, and hence he tries to find plausible candidates in the present to act as referents and truthmakers for claims about the past. Prior admits he isn't too sure what exactly these the truthmaking features are, and suggests that it could even be some feature of the earth as a whole, which is why this position is called global property presentism.

Prior's point is not grammatical but ontological. He is not arguing that the true grammar of past tensed expressions implies that we are really talking about general features of the earth. I am sure he recognises that the grammar of 'Queen Anne is dead' is most naturally read as the attribution of something to some particular entity. But his appraisal of the ontology of time, i.e. that the past does not exist, convinces him that the grammar of past tensed expressions *must be misleading*, and consequently suggests another way of understanding them.

Prior's position can be criticised for being too vague. Surely, the claim 'Queen Anne's death was peaceful' and 'dinosaurs roamed the Earth' are made true by different things, but his suggestion doesn't give much guidance as to which features of the present this would be. Very

plausibly, Prior means to say that Queen Anne's death must have left a mark on reality, to contribute somehow to what it is like today. However, he doesn't give any details about how such marks are left, and where to find them. I'll venture to offer more detail. We find out about Queen Anne's death by checking what is documented in historical records. So, the *historical record*, and its endurance in the present from the time of her death until now, is a much better suggestion than the earth as a whole about what it is about the present world that justifies our belief that there indeed was such a thing as Queen Anne's death. Fossilised remains of dinosaurs represent the particular marks left on reality by the dinosaurs of the past, preserved in what could be called the *natural record* of the past. We then have two distinct features of the present world to support our belief in the death of Queen Anne and in the prehistoric existence of dinosaurs. But do such entities really make our beliefs true, as opposed to simply constituting our grounds for belief? We'll return to that question later.

ABSTRACT ENTITY PRESENTISM

Others have suggested, as truthmakers for past tensed expressions, various abstract entities that are not to be understood as properties of the concretely existing present. For instance, that expressions like 'Socrates was wise' refers to an *individual essence* of Socrates, a kind of abstract entity that could exist even if Socrates' has physically ceased to exist (Craig 2000, p. 199, [9]). I find this suggestion too arbitrary and epistemically uninformative. It's very easy to postulate that everything that comes to be in the present leaves an incorporeal trace of itself that somehow endures in the present thereafter—and to appeal to such incorporeal entities to support one's belief that P is true—but it is difficult to identify those traces and extract any information about the past from them. Furthermore, this strategy converts presentism from one of the sparsest ontological doctrines of all, into something much less sparse; in addition to the present being constituted by the current state of the world, it also consists in the incorporeal individual essences left by every becoming in the history of the universe. I don't have a knock down argument against such a view. The best I can do is to challenge the need to postulate it.

Another option is *ersatz presentism*. Instead of postulating individual abstract entities for each concrete particular and/or event that ever existed, ersatz presentism postulates that at each present moment, there exists, for every future and past time, a set of propositions representing the state of the world at those times (Bourne 2006, [4]; Crisp 2007, [11]). Now, sometimes it appears that such ersatz times are only postulated for representational purposes, to allow us to talk about the future and past (Wüthrich 2012, p. 445, [35]), but of course this would not go a long way towards answering any objections to presentism. On the other hand the same writers claim that ersatz presentism represents a promising solution to the problem of reference and truth (Wüthrich 2012, *abstract*, [35]).

Like Mozersky (2015, p. 44, [24]), I worry that if ersatz times are assumed to have a truthmaking function this threatens to reverse the ontological priority of the present. The core idea of presentism, as I understand it, is that reality is grounded in the concretely existing present. Ersatz presentism instead construes times as abstract propositions, which then somehow make true anything expressed about concrete events at various presents. Now, obviously it is possible to argue that the ersatz times that represent the past are marks left by the past, in the same way individual essences are, but this won't work for the future, because it has yet to make a mark on the present.

In addition, ersatz presentism doesn't explain either how these ersatz times figure in our epistemic practices and so cannot be used to support our beliefs about the past. It is still the case that we learn about dinosaurs from fossils in the ground and not by accessing a realm of abstract propositions. Furthermore, none of the options that postulate abstract entities address at all the issues we have about causation and persistence.

The main worry about these general, incorporeal, and abstract entities that presentists are postulating is that they are entities that do not really come with a story of genesis; how do they come into being, if at all? Nor do they come with a story about how they figure in our epistemic practices. They are difficult to understand as marks on present reality that could somehow *inform* us about the past. They appear instead as arbitrary postulations about the world having whatever feature required to make some or other expression about the past true. In other words, the preferred procedure seems to be that we first decide—on sheer in-

tuition it seems—which propositions about the past are true, to then infer that the world must at present bear some truthmaking features that make those propositions true. This just isn't in conformity with what we actually do in our epistemic practices. We justify our beliefs about the past by appealing to the historical and natural record. These records exist concretely in the present in the form of various man made artefacts (books, audio recordings, photos, films, archaeological artefacts, *etc.*) and natural remains such as fossils, layers of soil and rock, oil, *etc.* Nobody says that Socrates was wise because this is evident from his individual incorporeal essence, but because of what we learn from the historical record.

LUCRETIAN OR NOMIC PRESENTISM

A more concrete suggestion about what counts as a mark of the past in the present, is the concrete and determinate state of the world at any given time. The basic idea is that when things are alive and kicking, they leave a concrete mark on enduring reality; we have scars left as reminders of former times, and we find fossils in the ground. John Bigelow tells us that this is a core idea in Stoic presentism, and he cites Sextus Empiricus as saying: “if this man has a scar, this man has had a wound” (1996, p. 41, [3]). If we perceive that a man has a scar *now* we can infer that he has had a wound in the past. It isn't clear to me whether Empiricus intends to say that we actually ascribe the property of ‘having had a wound’ to the scarred man, but at least he is saying that we can infer from the state of things now, how something was in the past. This satisfies my qualms about how we find out about the past. The question is if our grounds for believing p , must be the same as what actually makes p true.

The name ‘nomic presentism’ (Kierland 2013, [20]), as far as I can tell, really denotes the same basic idea, but is more concerned with the modern idea that that on the basis of our knowledge of the qualitative state of the world at any given present, and our knowledge of the laws of nature, we are able to infer what the world was like in the past (and predict how it will be in future). To do this we don't need to postulate the existence of incorporeal, general, or abstract entities existing somehow parallel to the existing qualitative state of concrete reality. The laws of

nature are in turn perfectly befitting a presentist ontology, because the world instantiates them at any given time.

Now, I like nomic presentism as a view of the world and of how we find out about the world, but not as a way to make our claims about the past true. First, as a truthmaking theory it requires the world to be causally determined, in order that each state of the universe passes on—in an unbroken chain—information not just about itself and each immediately preceding state, but about every preceding stage. If the world was like that, it would certainly allow us to extract information about the past, but also makes the future as fixed and determined as the past. I find this to be an unwanted consequence.

The second problem is that even if we grant causal determinacy and ignore the problems of a fixed future, I still don't see how the present + laws can ground the truth of our beliefs about the past; not on any extant theory of truth. The present + the laws of nature, doesn't look in any way like the past, so it can hardly make our beliefs about the past true by corresponding to them. Appeal must be made to a completely different notion of truth.

There are theories about truth that do not require the existence of whatever it is a proposition is about, but I can't see that they will do the nomic presentist any good. The coherence and pragmatic theories of truth do not make truth reliant on what the world is like at all. The deflationary theory arguably rejects truth altogether, and the identity theory construes truth as an identity of a belief to a true proposition, not to the world (for a more detailed discussion of various truth-theories, see Ingthorsson, *forthcoming* [18]). The identity theory may work for some forms of ersatz presentism, but not nomic presentism. The suggestion will only work if we understand 'making true' in some altogether new and primitive way. I have yet to see presentists take a stand on this issue and won't speculate further on this issue here. Instead I will consider the alternative most presentists do not consider at all; why not simply deny that expressions about the past have truth values? I for my own part am perfectly satisfied as long as it is possible for a presentist to *justify* her beliefs about the past, say, that dinosaurs roamed the earth.

3 True vs. Justified Beliefs about the Past

Presentists deny the existence of the past, but they acknowledge the existence of everything that any scientific discipline has ever *de facto* appealed to in their justification of theories/hypotheses about the past—man made documentation, fossils, evolution theory, knowledge of the laws of nature—because they all obtain now. Consequently, justification is obviously no problem at all. But, the beliefs we justify about the past cannot correspond to anything. Does this mean that we cannot say that we have knowledge about the past? Well, it does at least imply that our knowledge about the past is at best hypothetical and fallible, which is what is already acknowledged about our knowledge about the present. If knowledge is justified belief that is also true, knowledge is by definition *infallible*. A belief that is true, will not just never happen to be falsified; it cannot be falsified (it can only be falsely falsified by some experimental mistake).

More than anything, this problem revolves around the philosophical question of how exactly to understand knowledge. It does *not* really concern the epistemology of the past or our current epistemic practices. No A- or B-theorist argues that we find out about the past in any other way than by inferring it from the historical and natural record as it exists at any given time. That simply is the way science works. Accordingly, this discussion only concerns our general attitude towards the past—do we believe it exists or not—and with our understanding of knowledge generally speaking. I will focus on the latter question, which I understand to be a question of whether we can allow knowledge to come in degrees; is some knowledge both justified and true, and is some knowledge only justified?

The first thing to note that a conception of knowledge about the past as only justified but not true, is not equal to a conception of knowledge about the present as only justified but not true. If we believe something about the present on the basis of the available evidence, but it fails to correspond to reality because the available evidence was incomplete, then our belief is false because it represents reality as it really isn't. However, if we believe something about the past on the basis of the available evidence but it fails to correspond to reality because the past has ceased to exist, this does not mean that the belief represents the past as it really wasn't. Sure, to make this argument really stick, one would

have to develop a theory of falsemaking, which I will not do here. However, I think the point is intuitively clear enough for my present purposes, notably that lack of truthmakers for past tensed expressions does not make our ideas about the past into misrepresentations of the past, but the lack of truthmakers for present tensed expressions will inevitably mean that these expressions misrepresent reality.

Second, the idea that knowledge has to be true *and* justified is already too strict to comply with received views about what counts as knowledge. We generally call everything knowledge that strikes us as justified on the basis of the available evidence, never mind whether it actually is true. We even call some things knowledge that we know is false. Take classical mechanics as an example. We know that classical mechanics is at best a useful approximation to reality, but it continues to be a staple in physics education and continues to be called knowledge. It continues to be a part of the curriculum because it is so useful and much easier to apply in the situations where it is known to give the same results as quantum mechanics and theory of relativity respectively. At the very least, our beliefs about the past that are justified by the historical record would continue to be called knowledge even if we agree it cannot correspond to a past that no longer exists. Otherwise put, the concept of knowledge that is already in use, is one that allows of degrees.

On a related note, some may worry that the lack of truth-values for expressions about the past implies that the past is indeterminate. Statements about the past are popularly believed to have determinate truth-values because once things happen in a certain way in the present there is no way to undo or change it. However, I can't see that truth has much to do with determination. For mind-independent reality to be determinate, it is not required that there be propositions about it with determinate truth-values, nor is it required that the past be determinate for it to be true that whatever happens in the present is determinate and can never be undone. It is enough to know that what happens in the present is always determinate for us to know that what happened in the past also *was* determinate, because when it happened it was present and thus determinate. This conclusion holds whether or not we know anything about the past. The intuition that once things have happened, they can never be undone, is satisfied perfectly well by the consideration that once things have happened and ceased to exist, they

cannot be undone; you cannot go back to a non-existent past to undo it. And anyway, it is supposed to be the case that propositions have determinate truth-values because reality is determinate, not the other way around.

So, would it be so outrageous to suggest that the idea of knowledge being true justified belief may perhaps be useful as a regulative idea for what we ideally strive towards, but fails to demarcate between what is today counted as knowledge and what doesn't. All things considered, it would seem a little thing to allow our beliefs about the future and past to be called knowledge, if the available evidence justifies them, even if they cannot in principle correspond to anything. I take it to be an open question still, in epistemology, whether knowledge is to be demarcated in terms of true justified belief or not. Consequently, philosophy of time should not decide in favour of one particular theory of time on the basis of a premature stance on what is the correct view of knowledge. That would be a case of letting one epistemic position override any metaphysical concerns, to settle a metaphysical issue.

What I have so far argued with regards to knowledge and truth does not of course prove anything. It just serves to show that the consequences of denying that past and future tensed propositions can be true, are not so serious as to make that option unthinkable. It does not have any implications for our current epistemic practices, nor diminish our prospects of justifying our beliefs. Let me now turn from truth and knowledge, to persistence and causation.

4 Persistence and Causation are Not Cross-Time Relations

Can persistence and causation be explicated in presentistic terms, i.e. without invoking cross-time relations? The answer is yes, and this should not be news to anyone. The Aristotelian account of change, persistence, and causation already is presentistic. Let us briefly consider the Aristotelian account of change, in contrast to the contemporary characterisation of change as “simply difference or nonidentity in the features of things” (Mortensen 2016, sect. 1, [23]). The latter is sometimes cashed out more formally in terms of a conjunction of (or difference between) two states, i.e. ‘*a-is-G-at-t*’ and ‘*a-is-not-G-at-t**’, which can

very easily be interpreted as a cross-temporal characterisation of change, notably as a relation between the temporal parts of *a* which are *G* and *not-G* respectively. This is what Johanna Seibt calls the ‘state analysis of change’, which she argues is one of many unquestioned presuppositions in what she calls the ‘paradigm of substance ontology’ (1996, [31]). But the substance ontology she has in mind is not the Aristotelian ontology; it is the ontology favoured in 20th Century analytic philosophy, by philosophers that notoriously resist primitive notions.

Far from being a relation across times between two states of a thing, the Aristotelian account of change in terms of alteration, i.e. a material substance ceasing to manifest one quality and beginning to manifest another contrary quality, *excludes* that change can involve any such relation. Since the two states of a thing, before and after the change, are contrary states of one and the same entity that *endures* through the change, the existence of one state excludes the existence of the other. Change simply cannot be a relation between existent states, located (existing) at different times, at least if we accept the idea that relations can only hold between existent entities.

As I have argued elsewhere (2001, [13] and 2016, ch. 7, [16]) the problem of temporary intrinsics—which is meant to show that things cannot really endure—arises only when it is first assumed that all times exist in parity; it is only on the assumption that ‘*a-is-G-at-t*’ and ‘*a-is-not-G-at-t**’ are equally existent and real entities located at different times that we get the conclusion that *a* is equally *G* and *not-G*. Indeed, David Lewis admits that presentism, which denies temporal parity, avoids the problem (1986, p. 222ff, [21]). Accordingly, the only thing the problem of temporary intrinsic establishes is that the attempt to combine endurance and eternalism leads to contradiction; ergo, things cannot endure in tenseless time (for a more detailed argument, see Ingthorsson 2009, [15]).

Otherwise put, the Aristotelian account does not portray a succession of states as *constituents* of change—it is not what change consists in—but a *consequence* of change, i.e. of the alteration of something from one state to a contrary state while remaining numerically the same. The state analysis can really only be understood either as a description of the *appearance* of change (we first observe *a* to be *G*, and later we observe it to be *not-G*) or it is a statement of what change must be like if one assumes eternalism to be true.

Indeed, persistence, and causation cannot possibly be cross-temporal relations either on the Aristotelian account, for the very same reason change cannot be a cross-temporal relation (admittedly, this is not as obvious in the case of causation). Persistence cannot be a cross-temporal relation if, as the Aristotelian assumes, things persist by enduring; i.e. if they pass from one time to another and in that process cease to exist at the time it passes from. On this view, an object existing wholly at t_1 cannot stand in a relation to itself at other times because it doesn't exist at any other time. Indeed, already Aristotle addressed the problem of temporary intrinsics, which he attributed to the Sophists, notably the argument that Chrysippus in the market place is not identical to Chrysippus in the gymnasium, because some things hold true of the former that does not hold for the latter (*Physics*: Bk. 4, Part 11, [2]). Aristotle's solution is that Chrysippus remains numerically the same while losing and acquiring properties as he saunters from the market place to the gymnasium. When in the market place, there is no Chrysippus in the gymnasium, and vice versa.

Another interesting example of when prior commitments affect the appreciation of philosophical views—and which helps to understand why contemporary philosophers are not comfortable with presentism—is that it is difficult to deal with presentism in the language of first order predicate logic. At least if first order predicate logic is meant to function like Quine prescribed, notably to specify our existential commitments (for arguments to this effect, see Øhrstrøm and Schärfe 2004, [36]; Seibt 2016, [33]). Sure one can introduce temporal operators, but on Quine's understanding, such operators must operate on something existing, wherefore the use of past tense operators to talk about Chrysippus in the market place is still to quantify over existents (there exists an x such that Px). Indeed, as Øhrstrøm and Schärfe argue, it was concerns about Quine's idea about ontology that drove Arthur Prior to develop a temporal logic of a different kind.

Now, I do not want to get entangled in the details of the endurance vs. perdurance debate. I have nothing to add to what I have elsewhere argued (2001, [13]; 2009, [14] and 2016, ch. 7, [15]). The important point for this paper is simply to point out that the problem of cross-time relation is not a *reductio ad absurdum* of presentism because alternative explanations of persistence and causation are available. The alternatives may well be problematic in many respects, but those who appeal to the

problem of cross-time relations do not often take any such problems into consideration; they typically assume that no options exist.

Let us now consider causation, and again turn to Aristotle, at least initially. As with the case for change, there is a tension between the Aristotelian account of causation and what I take to be the received view in philosophy today, notably, that causation is at rock bottom a relation between temporally distinct events. The latter has become so well entrenched in the philosophical tradition that there is little or no awareness of alternatives. Consider that Jonathan Schaffer's entry on 'The Metaphysics of Causation' in *The Stanford Encyclopedia of Philosophy* (2016, [30]) is written entirely on the assumption that all extant views portray causation as a relation, and that the controversies about causation only revolve around the nature of the relata or of the relation. Schaffer does discuss various problems with what he calls *causal processes*, but deals with them as if they are composed of sequences of stages and/or events. Schaffer seems unaware of the fact that philosophers like Salmon (1984, p. 139ff [29]) and Seibt (2000, [32]), explicitly reject an event ontology of processes, and likewise that Ingthorsson (2002, [14]), Chakravartty (2005, [7]) and Mumford and Anjum (2011, [25]) explicitly argue that causation should be thought of as a process *instead of* as a relation. Clearly there are non-relational conceptions of causation also in contemporary philosophy, but let us here focus on the traditional Aristotelian view.

Note however, that the account I offer is not Aristotle's original view. It is a paraphrase of a view widely attributed to the Aristotelian school of thought. It comes very close to the account stated by Hobbes in the very early beginnings of empiricism (1656, ch. IX–X, [12]). Bunge (1959, ch. 2, [5]) and Johansson (1989, p. ch. 12, [19]) offer similar paraphrases of the causal realist tradition they trace back to Aristotle. The main difference from the original view, is that it does not include final causes. Indeed, already Hobbes argued against final causes (1656, p. ch. X, sect. 7, [12]), although his account is roughly Aristotelian in many other respects

According to the roughly Aristotelian view I have in mind, then, new states of affairs are produced when an already existing material body, or complex of bodies, changes due to an external influence without which the change would never have come about and the new state of affairs never exist. The kernel of this view comes out clearly in the slogan

‘whatever comes to be is necessarily born by the action of a cause’; very probably a paraphrase of Aristotle’s claim that “everything that comes to be comes to be by the agency of something and from something and comes to be something” (*Metaphysics*, bk. 7, part 7, [1]). Typically, the external influence, or cause, is depicted in terms of an ‘extrinsic motive Agent’ (or, simply *Agent*, i.e. an object possessing an active causal power), which exerts that power upon another object. The latter object is typically called *Patient* since its role in the interaction is to passively receive the influence exerted by an Agent and change in some specific way in accordance to its passive power, i.e. an ability to change in some specific way in response to the influence of the active power. Accordingly, a *cause* is the exertion of influence by an Agent upon a Patient and an effect is the resulting change in the Patient.

When I say that a cause is the action of an Agent upon a Patient, then one should not understand a cause as merely the action of the Agent, but as the *interaction* between Agent and Patient. It is this interaction that I identify with a *process of production*, and there are two salient features of this process that need emphasis, because they stand in stark contrast to the relational view of causation. The first point is that *causal influence* is something that is exerted by an Agent on a Patient. In other words—and this is critical for understanding the main point of this paper—actions occur between *persistent objects*, not between *events* or *states*. It is not the cause that acts on or influences the effect, indeed, that is impossible. If the effect only comes into existence by being produced by the cause, i.e. by the action of the ‘efficient cause’, the effect cannot be subject to the very same action that is supposed to produce it. To assume the effect is subject to the action that produces it, is to assume the effect already existed when it is acted upon, and thus could not have been produced by that very same action. Indeed, we see in the following passage from Hobbes a clear statement both of the idea that actions occur between persistent objects, and that the effect only comes into being as a consequence of actions between persistent objects:

A body is said to work upon or *act*, that is to say, do something to another body, when it either generates or destroys some accident in it: and the body in which an accident is generated or destroyed is said to suffer, that is, to have something done to it by another body; as when one body by put-

ting forwards another body generates motion in it, it is called an AGENT; and the body in which motion is so generated, is called the PATIENT; so fire that warms the hand is the *Agent*, and the hand, which is warmed, is the *Patient*. That accident, which is generated in the Patient, is called the EFFECT (Hobbes 1656, part II, ch. IX, sect 1, [12])

The second point is that the Aristotelian view depicts effects as the product not of the action of the Agent alone, but of a *total cause* of a certain kind; it is a product of the way two or more material bodies act on each other in virtue of their powers to produce a change in those very bodies. Again we can appeal to Hobbes as witness:

[...] an entire cause, is the aggregate of all the accidents both of the agents how many soever they be, and of the patient, put together; which when they are all supposed to be present, it cannot be understood but that the effect is produced at the same instant; and if any one of them be wanting, it cannot be understood but that the effect is not produced.

(Hobbes 1656, ch. X, sect. 3, [12])

Joining now together the Aristotelian account of change, persistence, and causation, there is not much conceptual space left to think of causation as a two-place relation between two existents existing at different times. Whatever material entities there exist at one time will pass in their entirety to the next by virtue of enduring, whether it be unchanged or changed by any occurring causal influence. Furthermore, an event or state existing at one time does not cause the next by somehow standing in an unanalysed and/or primitive relation of 'production' to the later event/state. Causal production is analysed in terms of a change in a complex of objects provoked by an influence exerted between those objects. Since the influence is exerted between objects, and the temporal relation between those objects is permanently synchronous, there never is a diachronic relation of influence between anything. In particular, the relation of production cannot be such a diachronic relation because whatever produces anything ceases to exist in that process.

The Aristotelian view I have described seems to me to be in accordance to all major schools of thought before the rise of empiricism (in

the particular respects considered here). In Atomism, Stoicism, Scholasticism as well as in the corpuscular view endorsed by the natural philosophers of the early enlightenment, the common assumption is that influence is exerted between two material objects whose relation is synchronous. Indeed, as far as I can tell, this is still a standard understanding in particle physics. All the fundamental forces of nature are exerted between persistent entities (some of them do persist very briefly, that is true, but persist nevertheless). In the *Large Hadron Collider* they are not accelerating events to make them smash into other events; they accelerate particles to make them smash together to break each other up. In chemistry the assumption is that various substances react with each other. Oxygen reacts with some fuel to combust; oxygen does not react with combustion. Furthermore, the common sense conception is that bodies act on each other: the leaden ball dropped upon a pillow acts on the pillow to make a hollow (the falling doesn't act upon the forming of a hollow); the horse pulls the cart (not: the motion of the horse that pulls the motion of the cart); the brick hits the window (not: the motion of the brick hits the breaking of the window).

5 Conclusion

The very humble conclusion that this paper leads up to, is simply that presentists would not be absurdly out of touch with reality were they to suggest that future and past tensed propositions just are not true, or to deny that persistence and causation are at rock bottom cross-time relations. They should argue that while future and past tensed expressions just can't be technically true, we still have all the reasons we ever have had to believe what the past used to be like and what the future will be. No loss epistemically to deny the existence of the future and past. And they should point out that the idea that persistence and causality are cross-temporal relations is a peculiarly Humean/empiricist conception that doesn't resonate with the Aristotelian view of things.

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