COUNTING ACROSS TIMES

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> It is possible, then, for the present to be false when the preterite is true. Of the same sort, too, is the proposition "Helen had three husbands," for neither when she had Menelaus as her husband in Sparta, nor when she had Paris in Ilium, nor when, after his death, she married Deïphobus, is the present – "she has three husbands" – true, though the preterite – "she had three husbands" – is true.
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> Sextus Empiricus, Against the Physicists, 2.98.

0. Methodological preamble

Presentism is sometimes said to be nothing more than a bit of common sense – a view so obvious only a philosopher would want to deny it. Ask the man on the street whether there are dinosaurs in Montana or outposts on Mars, and learn from his answers that no one really believes in merely past or future entities.[1] The past is no more, the future is not

yet; everything is present. Still, lingering doubts remain. Wise and plainspoken though the common folk might be, their answers can still be wrong or misunderstood.

What exactly do presentists believe? That everything is present.[2] The problem with this formulation is immediate – if we take the present tense of 'is' seriously we should conclude that the claim is not only plausible but tautological: it says, roughly, that everything is at present present. So, perhaps presentists believe something more complicated, say, that everything that is within the most comprehensive domain of quantification exists at the present time. But the added complexity makes things worse: instead of one tensed verb now we have two. The claim that everything that is at present within the most comprehensive domain of quantification exists at present at the present time is still a tautology. Since the main verb within a complete English sentence obligatorily carries tense, the problem cannot be easily sidestepped.

To properly formulate the thesis presentists are after we have to be less serious about tense. Perhaps 'everything is present' has a tenseless reading, or short of that, perhaps it can be used to convey a tenseless proposition. Presentists certainly want to take 'everything is present' to be about the present, they just don't want it to be about the present both on account of the word 'present' and on account of the tense of 'is.' That claims of existence in ontology are best understood in a tenseless manner was clear to Russell, who wrote: "when I say 'The so-and-so exists', I am not going to mean that it exists in the present or in the past or in the future, but simply that it exists, without implying anything involving tense."[3]

The simplest way to mark that the presentist thesis is meant tenselessly is to state it in a language that permits tenseless predication. For example, in the language of the

predicate calculus the thesis can be formulated as '∀x. present(x)'. Alternatively, we can employ a device whose semantic role is de-tensing. Let's say that if V is a tensed English verb then the semantics of **V** is just like that of V, except that the tense marking remains uninterpreted. Then the presentist thesis can be stated as 'everything **is** present.' I will use this convenient typographic device throughout this paper.

The presentist, unfortunately, does not have much to say to someone who claims not to understand '∀x. present(x)' or 'everything **is** present.' There is no denying that these are not English sentences, and it is far from self-evident that they have adequate translations to English. If we really must take tense seriously in all predication then, I suspect, we really cannot take presentism seriously at all. I hope (and without further argument will henceforth assume) that the situation is not as grim as that. I think I do understand '∀x. present(x)' and 'everything **is** present', and so I hope do my readers.[4]

Once we manage to state presentism properly the thesis no longer looks like a truism. The man on the street doubtless agrees that there are no dinosaurs, but would he also agree that there **are** no dinosaurs? It's hard to know. In fact, presentists should be concerned that their opponents can now turn the table in the debate. The folk (let's hope) do believe that there were dinosaurs, and one might reasonably wonder (not that the folk would) whether the content of such beliefs actually entails that there **are** dinosaurs in the past, and hence that there **are** dinosaurs after all. If that were the case, we would have to say that in virtue of holding some ordinary beliefs we are all committed to the existence of merely past entities, whether or not we are willing to face up to our commitments. The topic of this paper is whether there is a good case against presentism along this and related lines.

Arguments against presentism often employ specialized vocabulary. Some use metaphysical terms (e.g. "presentists cannot provide truth-makers for past tense sentences but since truth supervenes on being, there must be such truth-makers"); others scientific ones (e.g. "presentists are committed to absolute simultaneity but as the theory of special relativity shows, there is no such thing"). My focus in this paper is on arguments formulated exclusively in words from a pocket dictionary. Because of their simplicity, these arguments are often viewed as resting on common sense alone – but they really should not be. Since there is no uncontroversial way to state what presentists believe in a natural language, there is correspondingly no uncontroversial way to state the arguments for or against presentism. Common sense cannot be the ultimate arbiter here.

When we sincerely disagree about the validity of certain arguments we should see what our best semantic theory says about them.[5] As it stands, this is not a very helpful advice – we simply don't have a satisfactory semantic theory for any natural language. What we have are often incompatible theories about small fragments, speculations about how these theories might be extended to larger fragments, and hopes that this project will eventually cover all linguistic expressions in all natural languages. Still, sometimes we can pass a reasonably confident judgment that our best theory will validate a certain pattern of inference. There are arguments in metaphysics that do just this; I will call them semantic arguments.

Here is a venerable (albeit not uncontroversial) semantic argument, for the sake of illustration. 'Two is an even number' is a true English sentence, any adequate semantic theory must treat 'two' as it occurs in this sentence as a singular term, and 'is an even number' as it occurs in this sentence as a complex one-place predicate; thus any adequate

semantic theory will entail that ‘two is an even number; therefore there is something such that it is an even number’ is a valid inference. Acceptance of a trivial arithmetic truth thus carries ontological commitment to even numbers. Another semantic argument (appealing to what an adequate semantic theory would say about the interpretation of ‘even’) shows that commitment to even numbers yields commitment to numbers.

I argue in this paper that the common semantic arguments against presentism fail. I begin in section 1 by surveying three standard arguments and their standard retorts. In section 2, I present a fourth argument – first hinted at by Diodorus Cronos, explicitly formulated by David Lewis. I think this is the best semantic argument against merely past entities but it massively overgenerates: if we accept it we will have no principled reason to reject analogous arguments for the existence of merely possible and merely alleged entities either. Section 3 is devoted to a semantic explanation of the inferential properties of the problematic sentences to which Diodorus and Lewis have called attention. The theory offers an escape for presentists but not without ontological costs. In section 4, I briefly discuss the question of whether the costs are worth accepting.

1. Standard semantic arguments against presentism

There are three standard semantic arguments against presentism; each comes with a more or less standard response. The responses tend to utilize the moves made against analogous arguments for the existence of merely possible or imaginary entities by actualists – proponents of the claim that everything is actual, or more verbosely, that

everything that is within our most comprehensive domain of quantification actually exists.

1.1. The basic argument

The most fundamental semantic challenge to presentism is to show how it is compatible with the truth of sentences such as (1) – assuming dinosaurs do not exist. The worry is that (1) appears to predicate something of dinosaurs (i.e. that they roamed the earth), which seems to entail that there **are** dinosaurs (i.e. dinosaurs that roamed the earth). (2) and (3) present analogous challenges to actualists – assuming aliens and unicorns do not exist.

(1) Dinosaurs roamed the earth.

(2) Aliens might have abducted people.

(3) Unicorns are allegedly attracted to virgins.

Actualists usually meet their challenge by defending the thesis that modal auxiliaries like 'might' and adverbs like 'allegedly' are operators whose interpretation does not involve quantification over merely possible or imaginary entities. Consequently, we cannot view 'might have abducted people' and 'are allegedly attracted to virgins' in the true readings of (2) and (3) as complex expressions predicated of aliens and unicorns, respectively. At least since Prior, presentists tend to make an analogous move: they insist that tense morphemes and auxiliaries are operators whose interpretation does not involve

quantification over merely past or future entities, and that we cannot regard 'roamed the earth' in the true reading of (1) as a complex expression predicated of dinosaurs.

Presentists cannot adopt a neutral view towards the standard quantificational semantics of tense. Consider (4), an instance of the schema for interpreting the past tense operator:

(4) 'PAST (Dinosaurs roam the earth)' is true iff there **is** a past time t such that 'Dinosaurs roam the earth' **is** true at t

Presentists must either reject (4) (and say, for example, that 'PAST' is a primitive operator), or adopt an ersatzist metaphysics about times (and say that whatever past times are, they exist at present). Otherwise they would have to accept that 'Dinosaurs roamed the earth' – which they render as 'PAST (Dinosaurs roam the earth)' – does, after all, entail the existence of a merely past entity: a time t when 'Dinosaurs roam the earth' **is** true. Nothing new here – actualists face the same dilemma regarding the standard quantificational semantics of 'might' and 'allegedly'. They have to maintain either that these are not quantifiers (i.e. that (2) and (3) cannot be adequately interpreted as saying that in some epistemic possibility aliens have abducted people, and that in some alleged possibility unicorns are attracted to virgins, respectively) or that they quantify over some actual entities (sets of propositions, uninstantiated properties, fictional accounts, etc.)

The standard presentist reply works, assuming the syntactic and semantic analogies between (1) on the one hand, and (2) and (3) on the other are good and

assuming we don't want aliens and unicorns in our ontology. These are prima facie reasonable assumptions, at least in the absence of some powerful argument to the contrary.

1.2. The argument from names

The second standard challenge concerns proper names. What is crucial for the presentist response to the basic argument is the idea that in (1), 'dinosaurs' remains within the scope of the tense operator. This is why 'Dinosaurs roamed the earth' is not equivalent to 'Dinosaurs **are** such that they roamed the earth', which arguably does entail 'there **are** dinosaurs.' But proper names – according to some semanticists – are scopeless, in the sense that they can be validly exported from the scope of any expression. If so, 'Socrates was bald' is equivalent to 'Socrates **is** such that he was bald', and hence entails 'there **is** someone who was bald'. In other words, the challenge to the presentist is to give a semantic account for proper names that is compatible with the truth of (5):[6]

(5) Socrates was bald.

The best answer to this challenge is to remind ourselves that not all proper names are scopeless. It is clear that empty names cannot be exported from the scope of mental attitude verbs, such as 'think' – (6) is not a valid inference:[7]

(6) Sam thinks that Santa Claus is bald; therefore, there **is** someone whom Sam thinks is bald.

There are many proposals about how we might account for the invalidity of this inference, but none that is widely accepted. Whatever the semantic mechanism that ensures that 'Santa Claus' cannot be exported from the complement clause of 'Sam thinks' may also ensure that 'Socrates' cannot be exported from the scope of a past tense operator. Presentists believe that 'Socrates' is an empty name (although it has not always been empty) – it is no objection to presentism to point out that in certain respects it really behaves like one (although it has not always behaved that way).[8]

Some might complain that this answer is too radical. It is widely assumed that proper names are validly exportable from the scope of modal operators – if they cannot be exported from the scope of tense operators then tense operators are not only intensional, but hyper-intensional. As it stands, this is not a serious objection. It is a brute appeal to intuitions about very abstract theoretical questions within semantics – whether we should expect the semantic account of tense to be more similar to the semantic account of modality than to the semantic account of propositional attitudes. This is not an intuition about reference, truth, synonymy, etc. – not an intuition that semantic theories are supposed to provide a systematic explanation for. Moreover, it is not clear to me why anyone would trust pre-theoretical intuitions of this sort. (Would you trust your pre-theoretical intuitions that we cannot possibly share well over 90% of our genes with mice?) Unless substantive arguments can be brought to support this concern, the simple presentist response to the argument from names stands.[9]

1.3. The argument from cross-temporal relations

There are true sentences which apparently say that some relation holds between an entity in the present and another merely in the past. They pose an obvious challenge to presentism, for they appear to require the existence of a merely past entity – in case of (7), some Babylonian admired by some American.

(7) Some American admires some Babylonian.

In order to meet the challenge using the resources already mentioned, presentists would have to say that 'some Babylonian' is within the scope of a tense operator but 'some American' is not. As a first pass, presentists may recommend the following logical form:[10]

(7′) some x: [American (x)] (PAST (some y: [Babylonian (y)] (x admires y)))

An immediate problem with this proposal is that it remains somewhat of a mystery where that past tense operator is supposed to be coming from. The verb in (7) is in present tense and there appears to be no other source for tense within the sentence. But even if we set aside the question of how such a logical form could be compositionally derived, there remains a deep conceptual difficulty with the proposal. If (7′) is true then the two-place predicate 'x admires y' is satisfied. How can that be, given the presentist assumption that

it is never the case that both an American (a value for x) and a Babylonian (a value for y) exist?

I see both of these objections as serious but not decisive. Perhaps there is a way to squeeze out a secondary tense operator from the lexical meaning of certain transitive verbs. And perhaps there is sense to be made of tenseless satisfaction – i.e. the idea that 'x admires y' can be **satisfied** even though there is no time at which it is satisfied. Still, instead of issuing promissory notes, the presentist is better off looking for a more conservative response. The presentist should point out that 'admire' is an intensional transitive verb. I admire Sherlock Holmes but this cannot be a matter of my standing in the admiration relation to him for the simple reason that Sherlock Holmes does not exist – neither now, nor ever. Whatever the mechanism that explains why 'I admire Sherlock Holmes' can be true can presumably also explain why 'Some American admires some Babylonian' can.

But this cannot be the end of the matter. All the advocate of the argument from cross-temporal relations must do is substitute an extensional verb for 'admire' in (7) without changing its truth-value. Some of the examples used in the literature – predicates like, 'resemble' and 'taller than' – don't really fit the bill. 'Sherlock Holmes is taller than George W. Bush' and 'Sherlock Holmes resembles John Kerry' do not seem to be necessary falsehoods. But there are better examples: it is clear that neither Bush nor Kerry could have descended from Holmes. So, the presentist has a problem with (8):

(8) Some American descended from some Babylonian.

I am not sure whether there is a fully convincing semantic account of this sentence the presentist can accept. But there is hope. The reason nobody could have descended from Sherlock Holmes is that descendance is a causal relation: 'x descended from y' is true just in case some event involving y caused x's birth in the right sort of way. And if some version of the counterfactual analysis of causation is correct the presentist is likely to be off the hook: these analyses do not directly involve cross-temporal relations. (They may involve temporal sentential connectives but those are unproblematic as far as presentism is concerned: e.g. 'Jack walked after Jill talked' is true iff 'PAST (Jack walks $\wedge$ PAST (Jill talks))' is true.)

I strongly suspect that all predicates allegedly expressing cross-temporal relations are either intensional or causal; I certainly don't know a counterexample to this claim. If it is true, the presentist is well within her rights to deny that any English predicate expresses a relation between entities existing at different times.[11]

2. The argument from quantification

Diodorus Cronos held that nothing moves. He presented several arguments for this thesis, the most famous being that if a thing moves then it moves either in a place where it is (which cannot be because then it would then remain in that place) or in a place where it is not (which cannot be because it does not exist there). The argument is interesting, even if it stands no chance of winning converts to Zeno. But it is perhaps even more interesting that while Diodorus did want to deny that anything moves, he took it to be obvious that there are things that have moved. It is, after all, perfectly obvious that the very same thing

can be observed at one place at a time and at a different place at a later time. This could not be, he contended, unless the thing has moved from one place to the other.

Needless to say, such a combination of common sense and the lack thereof has puzzled many commentators. According Sextus Empiricus, who relates some of the ins and outs of the ancient debate, some have tried to refute Diodorus by claiming that no sentence in past tense **is** true unless its present correlate **was** true. If so, the present truth of 'This hand has moved' requires the truth of 'This hand moves' at some time in the past. Diodorus responded to the general thesis with a counterexample. The sentence 'Helen had three husbands' is true[12] because she was consecutively married to Menelaus, Paris, and Deïphobus. Nonetheless, the present tense correlate 'Helen has three husbands' has never been true.[13,14]

This is an important observation and it underlies what I take to be the best semantic argument against presentism. The obvious semantic explanation for why there can be true past tense sentences without true present tense correlates is that such sentences contain a quantifier that takes wide scope over the tense marking of the sentence. 'Helen had three husbands' is true because we count her husbands across times. But if that is legitimate then there **are** all those husbands to be counted, and so presentism is false.

Here is the argument in a bit more detail. (9) contains two scope-bearing elements: the quantificational determiner 'three' and the past tense of 'had'. Assuming with the presentist that the latter corresponds to an operator at the level of logical form, the following two scope possibilities arise:

(9) Helen had three husbands.

(9a) PAST (three x: [husband (x)] (Helen has x))

(9b) three x: [husband (x)] (PAST (Helen has x))

Consider (9a) first. This reading is true only if the sentence within the scope of the past tense operator – the logical form of 'Helen has three husbands' – was true at some time in the past. But there was no such time, so this reading is false. Now consider (9b). The presentist cannot accept this either: he is committed to the non-existence of merely past entities, and consequently holds that Helen's husbands no longer **exist**, which means that they **are** not within the domain of 'three husbands'. This leaves the presentist without semantic resources to account for the truth of (9): he is committed to the falsehood of both available readings.

I call this the argument from quantification. David Lewis has recently argued along these lines.[15] His example is 'There have been two kings named Charles'. He mentions that the quantification is intended as restricted, which we could make explicit as 'There have been two kings named Charles in England.' This sentence is presumably equivalent to 'England had two kings named Charles', which in turn presumably has the same sort of logical form as 'Helen had three husbands'.[16] Since the semantics of there-sentences is a complicated matter it is better not to focus on them in presenting this argument.[17] I will stick with Diodorus's example in most of the paper, although occasionally I will say a few things about there-sentences as well. My assumption is that the argument from quantification in no way depends on using there-sentences as premises.

The presentist has two options for resisting the argument from quantification. The first one is to reject the claim that there was no time when 'Helen has three husbands' was true. The idea is that although this sentence was certainly false at every moment in the past, it was nonetheless true at some past interval. Is this coherent? The usual understanding of truth at an interval requires truth throughout the interval, but this is no help here. 'Helen has three husbands' was not true at any particular minute or day of her life – why would it have been true throughout some longer periods of time? But suppose it was. Which were those intervals? Was the sentence true at an interval that started when Helen got married to Menelaus and ended when Menelaus killed Deïphobus? Was it true at an interval that started with Helen's birth and ended with her death? Was it true at an interval that started just before her second marriage began and ended a just a bit after her third marriage was over? It is not clear what the grounds for these decisions could be.

The second, more promising, option for the presentist is to deny that (9a) and (9b) are the only readings of (9). Since the reason (9a) is unacceptable is that it entails the simultaneous past existence of three husbands for Helen, the obvious strategy is to try to analyze 'three' using tools from first-order logic, and to inject past tense operators to separate the existential quantifiers from one another:

(9c) PAST (∃ x: [husband (x)] (Helen has x ∧

PAST (∃ y: [husband (y)] (Helen has y ∧ x≠y ∧

PAST (∃ z: [husband (z)] (Helen has z ∧ x≠ z ∧ y≠ z))))))

(9c) is true just in case there was a husband of Helen such that there was another husband of Helen such that there was yet another husband of Helen different from both. It seems that this is something the presentists could accept.

The most glaring problem with the proposal is its ad hoc character. Where are the three tense operators, the three existential quantifiers and all the negated identity formulae coming from? How is the baroque structure of (9c) supposed to be correlated with the syntactic form of 'Helen had three husbands'? It is fine to say, as Quine would, that for certain purposes we can regiment the English sentence into this formula. But Quine did not claim that regimentation preserves meaning – he did not even think it must preserve truth for all possible situations. It is by no means easy to see what sort of compositonal semantics would associate (9c) with (9). But let's set these worries aside – the proposal can be refuted more directly. It is enough to point out, as Lewis did, that this sort of translation yields an n-fold embedding of the past tense operator for the sentence 'Helen had n+1 husbands'. If we want to allow for the possibility that Helen might have had some of her husbands simulatneously and instanteneously we need even more complexity. And – as long as we insist that logical forms are of finite length – we can still not assign in this manner a logical form to 'Helen had infinitely many husbands.' This avenue appears to be a dead end.

Should we conclude that the argument from quantification is a success? I think this would be rash. If the intuition that (9) has a true reading is really sufficient to convince us of the existence of merely past entities, similar intutions should convince us of the existence of merely possible and merely alleged entities as well. Or so I will now argue.

Consider first the following case. You are discussing prospects of the election that will take place tomorrow. There are three candidates, one of whom is horrible. Being a pessimist, you think the horrible candidate is sure to win. But your well-informed friend consoles you looking at the latest polls by sincerely uttering (10):

(10) This election could have three outcomes.

Intuitively, (10) has a true reading. But there is no world where the election tomorrow has three outcomes, so (10a) is false. (If you deny this, you must abandon the entailment from ⌜COULD φ⌝ to ⌜in some possible world φ⌝.[18]) If you are an actualist, you will also shun (10b): there certainly aren't three actual outcomes such that this election could have each of them. And the actualist cannot help herself to (10c), because the procedure that yields this logical form could not assign an appropriate logical form to 'The election could have infinitely many outcomes.' It seems that we have to abandon our resistance to the truth of (10b) and reject actualism.

(10a) COULD (three $\underline{x}$: [outcome ($\underline{x}$)] (the election has $\underline{x}$))

(10b) three $\underline{x}$: [outcome ($\underline{x}$)] (COULD (the election has $\underline{x}$))

(10c) COULD ($\exists$ $\underline{x}$: [outcome ($\underline{x}$)] (the election has $\underline{x} \wedge$

COULD ($\exists$ $\underline{y}$: [outcome ($\underline{y}$)] (the election has $\underline{y} \wedge \underline{x \neq y} \wedge$

COULD ($\exists$ $\underline{z}$: [outcome ($\underline{z}$)] (the election has $\underline{z} \wedge \underline{x \neq z} \wedge \underline{y \neq z}$))))))

Lewis, for one, might have welcomed this result: he believed that merely possible entities exist. But even he would have stopped short of endorsing the next piece of reasoning. Suppose the villagers all believe that there are three magical creatures living among them (but it is not the case that there are three things such that they believe of them that they are magical creatures). They have a lot of shared beliefs – they agree on detailed descriptions for each alleged magical creature. In addition, they all think exactly one of the detailed descriptions fits a witch and the other two fit goblins. They also all agree that no witch is a goblin and no goblin a witch. But here their agreement stops: some think that the first description fits a witch, some think that the second does, and some that the third does. When the inquisistor comes to the village, he hears hundreds of allegations. As it happens, his superiors are really concerned about witches but think belief in goblins is sheer superstition. They don't even want to hear about goblin-talk. The inquisitor summarizes his findings in the intial sentence of his report as (11):

(11) The village allegedly has three witches.

I think (11) has a reading that is true in the situation described. But nobody alleges that the village has three witches (everyone says it has one), so it is hard to see how (11a) could be true. (If you think it is, you must abandon the entailment from ⌜ALLEGEDLY φ⌝ to ⌜according to some allegation φ⌝.) And if in fact there are no witches, there aren't three witches such that the village allegedly has each of them. So (11b) is false too. Furthermore, we cannot help ourselves to (11c), because the procedure that yields it cannot assign an appropriate logical form to 'The village allegedly has infinitely many

witches.' It seems that we have to embrace (11b) and believe in witches, after all. Unless, of course, there is something wrong with this whole style of argument.

(11a) ALLEGEDLY (three x: [witch (x)] (the village has x))

(11b) three x: [witch (x)] (ALLEGEDLY (the village has x))

(11c) ALLEGEDLY (∃ x: [witch (x)] (the village has x ∧
ALLEGEDLY (∃ y: [witch (y)] (the village has y ∧ x≠ y ∧
ALLEGEDLY (∃ z: [witch (z)] (the village has z ∧ x≠ z ∧ y≠ z))))))

There certainly are differences among (9), (10), and (11). I agree that the intuition that (9) has a reading that is true (in a world where the mythological story about Helen is true) is stronger than the intuition that (10) has a reading that is true (in a world where the story I told about the election is true), which in turn is stronger than the intuition that (11) has a reading that is true (in a world where the story I told about the villagers is true). This means that accepting the above argument against presentism and rejecting the one for the existence of witches is not entirely ad hoc. Still, the similarities should give us pause.

The argument from quantification against presentism overreaches. While it is natural to think that in saying that Helen had three husbands we are quantifying across times, there are almost equally good reasons to think that in saying that the election could have three outcomes we are quantifying across worlds and that in saying that there are alleged to be three witches we are quantifying across allegations. I think the natural

thought is to be resisted in all three cases. In the next section I will argue that (9), (10), and (11) each have readings we have overlooked.

3. Ships, passings, and anchorings

We ran into trouble because of the assumption that the relatively simple sentences we considered contain only two scope-bearing elements – the quantificational determiner 'three' on the one hand, the past tense morpheme, 'could', and 'allegedly' on the other. I think the sentences contain another scope-bearing element. To see why, we need to take a step back.

Simple quantified sentences give rise to a prima facie surprising ambiguity.[19] The following example is due to Manfred Krifka:

(12) Four thousand ships passed through the lock last year.

On one reading, the truth of (12) requires the existence of four thousand ships each of which passed through the lock last year. On the other reading, (12) could be true even if only a handful of ships have done so, as long as some of them did it repeatedly such that passings through the lock by ships last year number four thousand. Krifka calls the first reading object-related, the second event-related. I will adopt his terminology – intuitively, the first reading quantifies over objects (ships), while the second over events (passings).[20]

To capture the distinction between these two readings I recommend a Davidsonean framework. According to Davidson's analysis, the logical form of a

sentence like ‘Bill walked’ existentially quantifies over walking events by Bill.[21] Manner adverbs, locative and durational phrases are interpreted as predicates of events; when they occur as adjuncts in a simple sentence they are conjoined with the predicate expressed by the verb within the scope of the event quantifier.[22] Let’s neglect tense as well as the internal complexity of the prepositional phrase ‘through the lock’ and of the temporal adverbial ‘last year’; (13) has then the following simplified logical form:

(13) The Titanic passed through the lock last year.

$\exists \underline{e}$ (passing ($\underline{e}$, the Titanic) $\wedge$ through-the-lock ($\underline{e}$) $\wedge$ last-year ($\underline{e}$))

Here the event variable is bound by an existential quantifier that shows up in the logical form as a result of some default mechanism. When the sentence contains an overt adverb of quantification that expression sometimes plays the role of the variable-binder:[23]

(14) Twice the Titanic passed through the lock last year.

twice $\underline{e}$ (passing ($\underline{e}$, the Titanic) $\wedge$ through-the-lock ($\underline{e}$) $\wedge$ last-year ($\underline{e}$))

When the expression occupying the subject position is a quantifying phrase, the presence of the adverb of quantification sometimes gives rise to an ambiguity. When the quantifier over ships takes scope over the quantifier over passings we get a reading that requires a single ship passing twice; when the scope order is reversed the two passings can be done by different ships:[24]

(15) Twice a ship passed through the lock last year.

a o: [ship (o)] (twice e (passing (e, o) ∧ through-the-lock (e) ∧ last-year (e)))

twice e (a o: [ship (o)] (passing (e, o) ∧ through-the-lock (e) ∧ last-year (e)))

We want similar readings for (12) as well; the question is how to get them. The question is complex and there are different proposals in the literature.[25] Since my focus here is not to develop a particular semantic account, I will be brief and programmatic in suggesting my own. Consider first (16) – not quite grammatical, but interpretable, especially if you imagine it printed as a headline or shouted from the lighthouse in the dark. I imagine this sentence to contain an unarticulated nominal quantifier as well as an unarticulated adverb of quantification. Unarticulated quantifiers, let's assume, receive a default existential interpretation. Then (16) is ambiguous, like (15), except that the two readings are truth-conditionally equivalent:

(16) Ship passed through the lock last year.

∃o: [ship (o)] (∃e (passing (e, o) ∧ through-the-lock (e) ∧ last-year (e)))

∃e (∃o: [ship (o)] (passing (e, o) ∧ through-the-lock (e) ∧ last-year (e)))

Now assume that (12) is interpreted like (16), except that 'four thousand' can articulate whichever quantifier takes widest scope. This yields the following two readings for the sentence:

(12) Four thousand ships passed through the lock last year.

4000 o: [ship (o)] (∃e (passing (e, o) ∧ through-the-lock (e) ∧ last-year (e)))

4000 e (∃o: [ship (o)] (passing (e, o) ∧ through-the-lock (e) ∧ last-year (e)))

According to the first, four thousand objects **are** ships involved in some passing through the lock last year; according to the second, four thousand events **are** passings through the lock by some ship last year. These are the two readings the sentence has.

Suppose this is roughly correct.[26] How far does this ambiguity extend? There are two questions to consider: which determiners and which verbs give rise to event-related readings in simple quantified sentences? Regarding the first question, the correct answer appears to be that only weak determiners do. The term 'weak determiner' was introduced by Garry Milsark for expressions that are syntactically permitted to occur after sentence-initial 'there is' or 'there are'.[27] 'Every', 'most', and 'the' don't give rise to event-related readings and can't occur in there-sentences; 'some', 'five', and 'at most ten' do and can. 'Many' and 'few' are ambiguous: they have an absolute reading (when 'many/few Fs are Gs' means something like 'The number of Fs that are Gs is large/small') and a proportional reading (when 'many/few Fs are Gs' means something like 'The proportion of Gs among the Fs is high/low'). With the former interpretation 'many' and few' do yield event-related readings and can appear in there-sentences; with the latter they don't and can't:

(17) a. Every/most/the ships passed through the lock last year.

b. There are *every/*most/*the ships at the dock.

(18) a. Some/five/at most ten ships passed through the lock last year.

b. There are some/five/at most ten ships at the dock.

(19) a. Many/few ships passed through the lock last year.

b. There are many/few ships at the dock.

This is an important observation from the perspective of metaphysicians concerned to extract ontological commitments specifically from ordinary there-sentences. It suggests that the ambiguity may show up in these as well. Indeed, (20) is as much subject to the object-related/event-related ambiguity as Krifka's original sentence:

(20) There were four thousand ships that passed through the lock last year.

Let's turn now to the question which verbs can give rise to event-related readings. It seems clear that all verbs that are predicates of events do – there is nothing special about 'passing'. But there are verbs that describe states, rather than events – do they give rise to analogous state-related readings? I think they do. Getting a state-related reading for (21) is easy – just think of a port official writing up an annual report. She might write down the former sentence and her report would still be compatible with there having been many fewer than four thousand individual ships anchored at the port last year.

(21) Four thousand ships were anchored at the port last year.

4000 o: [ship (o)] (∃s (being anchored (s, o) ∧ at-the-port (s) ∧ last-year (s)))

4000 s (∃o: [ship (o)] (being anchored (s, o) ∧ at-the-port (s) ∧ last-year (s)))

If this is conceded, it is hard to see why there would be any restriction on verbs permitting event or state related readings in simple quantified sentences. Of course, tense matters. It is hard to hear a state-related reading for (22).

(22) Four thousand ships are anchored at the port right now.

But this might be simply due to our conviction that a single boat cannot participate in more than one state of being anchored at a time. If so, the state-related reading might be overlooked because the cases when its truth-value is different from that of the object-related reading are deemed impossible.

Still there is a problem: the state-related reading we assigned to (21) is impossibly strong. Arguably, if a ship was anchored at the port last year then there was some interval of time throughout which it was anchored. But then there was also another state that lasted a bit less long than the first one which was also a state of that ship being anchored, and another state that lasted a bit less than the second one which was also a state of that ship being anchored, and so on ad infinitum. We need the quantifier in (21) to be restricted. I think the most obvious restriction is to maximally continuous states. (A maximally continuous anchoring state of a particular ship is the sum of all the anchoring states of that ship that overlap some particular anchoring state. The notions of sum and overlap are to be understood with respect the duration of these states.[28]) This takes care of the problem. If a ship arrives at port at noon and leaves at 6pm then we have one maximally continuous anchoring state that lasted six hours. The state of the ship being anchored from 1pm until 3pm is not within the domain of quantification because it is not

maximally continuous. If the ship returns to the port a week later and is anchored again from noon until 6pm, we have another maximally continuous anchoring state. The sum of the two states is not within the domain of quantification because it is not maximally continuous.

The restriction of quantification over states to maximally continuous ones is universal as long as we do not use sentences that talk explicitly about states.[29] When I say that twice I was sick last year, I claim that last year there were two maximally continuous states of me being sick. If I got the flu on Monday, felt better on Wednesday, but was sick on Friday it may be unclear whether I was sick once or twice. The truth of the matter depends on whether I was healthy on Wednesday or just seemed not to be sick. If I was healthy on Wednesday I was sick twice, even if I was re-infected on Thursday by the very same virus I had on Monday.[30]

I don't want to go into the question of how best to think of the mechanism of domain restriction to maximally continuous states. To make sure that it is understood but without suggesting that this is more than a mnemonic device, I will simply indicate it by a subscript on the verb in the simplified logical forms I employ. So, the two readings I suggest for (22) are:

(22) Four thousand ships were anchored at the port last year.

4000 o: [ship (o)] (∃s (being anchored$_{mc}$ (s, o) ∧ at-the-port (s) ∧ last-year (s)))

4000 s (∃o: [ship (o)] (being anchored$_{mc}$ (s, o) ∧ at-the-port (s) ∧ last-year (s)))

Now we can leave the ships behind and return to Helen and her husbands. Still ignoring tense, here are the readings my analysis predicts for Diodorus's sentence:

(23) Helen had three husbands.

three o: [husband (o)] (∃s (having$_{mc}$ (s, Helen, o)))

three s (∃o: [husband (o)] (having$_{mc}$ (s, Helen, o)))

The first of these is the familiar object-related reading: three objects **are** Helen's husbands. The second is something new: it says that three (maximally continuous) states **are** states of Helen having a husband.

The two readings have different truth-values in certain circumstances. Suppose Helen actually divorced Menelaus when she left him for Paris and suppose she remarried him after he killed her third husband, Deïphobus. Then the object related reading of (23) is true but the state-related reading false: four, not three (maximally continuous) states **are** states of Helen having a husband.[31] Which seems fine – intuitively 'Helen had four husbands' does have a true reading in the situation described.

Adding tense to the analysis yields extra complexity. If tense is analyzed as an operator, in principle it could take wide, narrow, and intermediate scope in both readings. It is not clear that all those readings are in fact available – a good syntax and semantics would have to filter out the superfluous ones in a principled way. Let's hope that this can be done without eliminating the intermediate state-related reading. For that one is of special theoretical importance for the presentist.

(23′) three s (PAST (∃o: [husband (o)] (having$_{mc}$ (s, Helen, o))))

This says that there are three states that were (maximally continuous) states of Helen having a husband. The sentence is true because there are three such states: they are the states of Helen having had Menelaus as a husband, Helen having had Paris as a husband, and Helen having had Deïphobus as a husband. These states are not entities in the past. They exist now, so they **exist**, even by the presentist's lights.

The intermediate state-related reading for (24) is (24′):

(24) Helen kissed three men.

(24′) three s (PAST (∃o: [man (o)] (kissing$_{mc}$ (s, Helen, o))))

What is notable here is that while Helen kissing Menelaus is an event, Helen having kissed Menelaus is a state. (24) says that there are – at present – three states of Helen having kissed some man. These states were once the kissing events themselves. So, the analysis is committed to the idea that an event can become state, and hence, that events and states are not essentially different kinds of entities.

Terence Parsons calls the states (23′) and (24′) quantify over resultant states. They are cheap. Whenever an event occurred in the past, there is a state at present – the state of that event having occurred. Whenever a state obtained in the past, there is a state at present – the state of the former state having obtained.[32] They can be seen as shadows of the past, and as such, they are the sort of things presentists like to appeal to when they seek truth-makers for past tense sentences. But I am not pulling them out of a hat – I

claim that a good semantic account of simple natural language sentences quantifies over them. I will return in the next section to the question whether that is enough to make them metaphysically acceptable. For now, we should return to the semantics.

An appeal to intermediate state-related readings can help with possible outcomes and alleged witches as well. (I am neglecting the internal complexity of 'this election' and 'the village'.)

(25) This election could have three outcomes.

(25′) three s (COULD (∃o: [outcome (o)] (having_{mc} (s, this-election, o))))

(26) The village allegedly has there witches.

(26′) three s (ALLEGEDLY (∃o: [witch (o)] (having_{mc} (s, the-village, o))))

(25′) requires the existence of three states, each of which is a (maximally continuous) state of this election possibly having an outcome; (26′) requires the existence of three states, each of which is a (maximally continuous) state of the village allegedly having a witch. No commitment to possible outcomes or alleged witches follows.

The analysis can be generalized to there-sentences as well. Consider Lewis's example 'There were two kings named Charles'. Let us assume that this sentence is equivalent to (27) – and that (27) in fact gives us a good clue what the logical form of Lewis's sentence might be.[33] Applying the analysis above and neglecting tense, we get the following two readings:

(27) Two kings named Charles existed.

two o: [king-named-Chales (o)] (∃s (existing$_{mc}$ (s, o)))

two s (∃o: [king-named-Charles (o)] (existing$_{mc}$ (s, o))).

The intermediate state-related reading is

(27′) two s (PAST (∃o: [king-named-Charles (o)] (existing$_{mc}$ (s, o)))),

and it requires that there be two (maximally continuous) states of some king named Charles previously existing. This is as it should be.

There are two objections against the proposal I made on behalf of the presentist I want to consider. First, one might note that the intermediate state-related reading of 'Helen had three husbands' is false if Helen divorced Menelaus and later re-married him (because then there were two distinct maximally continuous states of her having him as a husband). Since the sentence does seem to have a reading that is true under these circumstances, it looks like the presentists' appeal to resultant states cannot disarm the argument from quantification. However, I believe the alleged reading is not real. I think this because those who insist that 'Helen had three husbands' has a reading that can be true even if Helen married Menelaus twice would naturally support their contention by expanding this sentence into (28):

(28) Helen had three husbands: Paris, Deïphobus, and Menelaus.

And once you go this far, it does not seem possible to reject (29) either, as a legitimate way of making the intended reading of 'Helen had three husbands' more precise:

(29) Helen had three husbands: Paris, Deïphobus, and Menelaus – twice.

I am not sure what the best analysis of (29) is, but there seem to be three reasonable constraints. First, the logical form of 'Helen had three husbands' within (29) is the same as within (28), which in turn is the same as the logical form of the intended reading of the sentence when it occurs unembedded. Second, the three items after the colon in (28) are conjoined, and hence, have the same semantic type; ditto for (29). And third, 'Menelaus – twice' is not a name of Menelaus. I think the best way to adhere to these constraints is to insist that the relevant reading of 'Helen had three husbands' quantifies over states (which can in principle obtain more than once), that the lists in (28) and (29) are list of the states (and hence, 'Paris' and 'Deïphobus' are understood as 'Paris – once' and 'Deïphobus – once', respectively). The consequence is that 'Helen had three husbands', is literally false if Helen married four times, even though it can convey a truth as a result of our willingness to double-count (i.e. count the two maximally continuous states of Helen having Menelaus as husband as if they were one).[34]

I expect that there will be some resistance to this last line of argument: to many it seems clear that 'Helen had three husbands' must have a reading that is literally true even if Helen was married to Menelaus twice.[35] The presentist may be able to accommodate this intuition – but at a price. The key is to relax the requirement that implicit existential quantification over states is always restricted to maximally continuous ones. Perhaps

sometimes the quantification is restricted to maximal states instead.[36] With that restriction in place, the state-related reading of the sentence comes out true even if Helen was married to Menelaus twice – there was just one (discontinuous) maximal state of her being married to him.

The second objection is that the proposal does not generalize properly. As noted above, only sentences with weak determiners have event- or state-related readings. While (30) is ambiguous between a reading that quantifies over kissing events (or, according to the proposal above, resultant states of kissing events) and a reading that quantifies over men, (31) only has the latter reading:

(30) Three men from Troy kissed Helen last night.[37]

(31) Every man from Troy kissed Helen last night.

The presentist is committed to the falsehood of the object-related reading of (31) unless all the kisses were given simultaneously. But clearly (31) can be true in the normal case – when the men from Troy kissed Helen last night one after the other.[38]

To respond to this objection we must distinguish between two issues: whether a sentence quantifies over resultant states, and whether it quantifies over resultant states introduced by the main verb of the sentence. (31) certainly does not quantify over states of having kissed Helen but it may well quantify over states of having been a man from Troy. An intuitively correct paraphrase of the sentence says that every state of having been a man from Troy has an extension that is a state of having been kissed by Helen last night. More formally:

(31′) every s: [PAST (∃ o: [man (o)](from-Troy$_{mc}$ (o, s)))]

(∃ s′ ≥ s PAST (kiss (o, Helen, s′)) ∧ last-night (s′))

While this logical form may seem ad hoc it is actually rather well-motivated. According one of the standard analyses, conditionals contain covert adverbs of quantification, which quantify over minimal situations and their extensions.[39] (32) says that every minimal situation s in which a man was from Troy has an extension s′ in which the unique man from Troy in s kissed Helen last night.

(32) If a man was from Troy he kissed Helen last night.

Setting aside metaphysical differences between maximally continuous states and minimal situations and the non-quantificational treatment of tense (31′) is just the standard logical form for (32). Moreover, (32) is clearly equivalent to (31). My conjecture is simply that (31′) is the shared logical form of both. This should not be very surprising if we assume that the quantifier 'every' can bind the situation variable while the object variable is bound by a default existential quantifier. The mechanism is the same as the one I briefly appealed to above in explaining how event-related readings arise for 'Four thousand ships passed through the lock last year.'

Some might think that allowing nominal expressions to introduce an event or state argument to logical form is a considerable cost. I think the introduction of such arguments is unavoidable. Consider (33):

(33) Every king was dethroned.

Suppose King Harold was dethroned but later regained the throne and was never dethroned again. Is Harold a counterexample to (33)? I think on at least one reading of the sentence he is: if every king was dethroned all royal rules must have ended in dethronement, but Harold's second reign did not. We can get this reading by construing 'every' in (33) as quantifying over maximally continuous states of being king: there were two such states involving Harold and only one of them had an extension that involved him being dethroned. It is hard to see how to do this without giving a state-argument for 'king' in logical form.

The two objections against the idea that apparent quantification across times is really quantification over resultant states fail. They each point at considerable complications the presentist must face in trying to develop an adequate semantics for tensed quantification, but the difficulties do not seem insurmountable. I am not claiming that I have developed a satisfactory semantics for tensed quantification here, but that is not required for an adequate answer to the argument from quantification. According to that argument there are certain obliviously true natural language sentences that clearly quantify across times. The considerations in this section are sufficient to rebut this claim.

4. Is presentism worth the price?

I am not a presentist. For all I know, the best interpretation of our best physics tells us that the world is a four-dimansional manifold of space-time regions – if it does I won't resist. But I am committed to the claim that the semantic arguments against presentism fail. Since I think all arguments aginst presentism that employ everyday vocabulary and appeal to common sense are semantic arguments in disguise, I take this as a significant point in favor of presentism.

My response to the argument from quantification can't stand unless the presentist is willing to pay the ontological price. In this regard, the argument from quantification is different in kind from the three standard arguments discussed earlier. A presentist who advocates the view that tense oparators do not have a quantificational semantics can dismiss the basic argument without ontological cost. He can accept the truth of 'Dinosaurs roamed the earth' without admitting that dinosaurs **exist.** The gist of the response to the argument from names was that proper names like 'Socrates' cannot be exported from the scope of tense operators. Here again, the presentist can coherently maintain that 'Socrates was bald' is true without believing that Socrates **exists**. The tentative response to the problem of cross-tempral relations was that such relations never obtain. Predicates that appear to express them are either intensional or causal – the former express no relations at all, the latter express relations that might be analyzed counterfactually without appealing to anything beyond standard temporal connectives and tense operators. So, accepting the truth of 'Some American admires some Babylonian' and 'Some American descended from some Babylonian' does not require one to believe that some Babylonian **exists**. By contrast, if I am right, the relevant reading

of ‘Helen had three husbands’ entails that certain tensed states – maximally continuous states of Helen having had a husband – **exist**.

I think the present existence of past tensed states is acceptable. One reason I think so is that I believe that ‘Socrates liked philosophy’ is a true English sentence and I am strongly inclined to think that the right semantics of English entails that its truth requires that some state of Socrates having liked philosophy **exist**. Unfortunately, I don’t have a knock-down argument for my semantic conjecture (although I can point at the literature for some good reasons), and I can’t even dismiss the view that ‘Socrates liked philosophy’ is literally false (but is standardly used to convey a truth).

Another reason I think tensed states **exist** is that they seem to make an explanatory difference. It seems right to say that my having hit traffic explains my missing the lecture or that my having run six miles explains my being tired. Denying that there are such states as my having hit traffic or my having run six miles robs one’s ontology of the right sorts of explanatory grounds. But this too is an argument that can be resisted. Perhaps the explanations are different; perhaps ‘my having hit traffic’ and ‘my having run six miles’ don’t pick out tensed states at all.

So, while I think there are some reasons for the existence of tensed states, I concede that none of them are conclusive. Are there reasons against their existence? I can think of three. The first is that such states are abundant. If there are any of them there are a whole lot of them. You can pick a true sentence in past tense and you can through a trivial transformation create a definite description designating a tensed state. If you had a good time at the party on Tuesday then your having had a good time at the party Tuesday exists. This seems too cheap – existence should be earned somehow. The second concern

about tensed states is that they are exotic. They come to be at some time and then remain in existence forever. Before Helen's marriage there was no state of her having had Menelaus as a husband, but once that state came to be it cannot cease to be. Traditional ontologies tend not to postulate entities of this sort. Finally, the third worry is that tensed states are otiose. The postulation of such entities won't really help the presentist. Even if there are such entities, they cannot be ontologically basic. The present existence of the state of Napoleon having been defeated at Borodino must be logically guaranteed by the present existence of more fundamental things. What are these? The obvious choice would include Napoleon, Kutuzov, and about a quarter of million French and Russian soldiers. But none of them exist now, so this is not an option for the presentist. Appeal to tensed states is nothing but a pointless diversion.

Let me say what I can in defense in response to these concerns. Let's start with the charge of abundance. I accept the view that, ceteris paribus, a theory with the smaller ontology is preferable. Ceteris, alas, is hardly ever paribus. A theory that postulates tensed states does have certain advantages over one that does not. That the semantic advantages are not significant enough to compensate for the ontological excess is a claim I find hard to assess. I like desert landscapes too – I just wouldn't chop down trees to get them.

The charge that tensed states are exotic is more interesting. Here is a way to bring out what might be behind the charge. Call an instantaneous world that contains all and only the entities that exist in our world now a snapshot duplicate of our world at this time. Since Hannibal crossed the Alps, there is now (according to those committed to tensed states) a state s of Hannibal having crossed the Alps, and since s is one of the things that

exist in our world now, s also exists in the snapshot duplicate. Assuming – reasonably, I think – that s is essentially a state of Hannibal having crossed the Alps, we must conclude that the snapshot duplicate contains a state of Hannibal having crossed the Alps. But then Hannibal did cross the Alps in the snapshot duplicate, which contradicts the assumption that it is an instantaneous world. If there are tensed states there are no snapshot duplicates.

I agree that this sounds surprising, but I think one can get used to it. What makes the rejection of snapshot duplicates prima facie unappealing is that it seems incompatible with Hume's thesis that there are no necessary connections between distinct existences. If there is no world that contains just what exists in our world now, then the present moment is necessarily connected to things in the past: the existence of the state of Hannibal having crossed the Alps necessitates the past event of him crossing the Alps. But note that this is not something the presentist would accept: he does not believe that Hannibal's crossing of the Alps **exists**. If there **are** no past events, admitting present tensed states in our ontology certainly won't generate necessary connections between distinct existences.[40]

What about the claim that admitting tensed states to our ontology is otiose because they do not help us understand how the present can ground the truths about the past? The truth-maker problem is the oldest and probably deepest metaphysical objection to presentism. As I mentioned in the introductory part of this paper, I do not propose any sort of response to it. The options for the presentist are clear: claim that no past or future tensed sentence is true (unless something takes scope over the tense marking), deny that true past or future tensed sentences require a truth-maker (roughly, some collection of

fundamental entities and a pattern of instantiation of fundamental properties and relations among them that jointly necessitate that the sentence is true), or find truth-makers for all true past and future tensed sentences. Proponents of the first option combine their view with a fictionalist story and assurances that even though 'The sun rose yesterday' and 'The sun will rise tomorrow' are literally false or lack truth-value, they nonetheless manage to convey truths when uttered in the course of communication. Proponents of the second option probably do best if they deny that there is some fundamental level of reality upon which all else supervenes. Those who wish to find truth-makers for all true past tensed sentences have work to do. The main options among those who take this path are postulating haecceities or admitting primitive tensed properties (of atoms or space-time regions).[41] I think the best avenue for the presentist is the last one, but I am by no means certain that it will in the end lead to a satisfactory view.

I do, however, want to resist the claim that tensed states are otiose unless they have an important role to play in the answer the presentist might seek to give to the truth-maker objection. Semantics is not a theory of truth-making, entities that are assigned to expressions of English as semantic values will typically not be ontologically fundamental, and they do not have to earn their keep by playing some important role in a grand account of how truth depends on being. In the end, I really don't see why we should find the existence of a state of Hannibal having crossed the Alps any more puzzling than the existence of the Alps.[42]

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[1] These and many other examples in the paper are from Sider (2001). His chapter on presentism started me thinking about this topic.

[2] Perhaps they believe something weaker – that everything temporal is present. This would be compatible with the existence of various things – numbers, shapes, concepts,

perhaps God – outside of time. Perhaps they believe something stronger – that everything is merely present. This would exclude entities that exist in the past or the future in addition to existing in the present. I will ignore both of these complications. Some presentists might prefer to state their view in terms of what is real, as opposed to what there is. If the claim that everything real is present is supposed to be weaker than the claim that everything is present, then presumably there must be some unreal things. For the purposes of this paper I will set aside this possibility as well. I will regard presentism as a pure ontological thesis in Quine's sense.

[3] Russell (1918): 248. That the presentist thesis should be construed as a tenseless claim has recently been endorsed by Ludlow (2004) and Sider (2006); see especially the discussion of Very Serious Tensism in the former.

[4] The claim that predication in English is inherently tensed is in any case exceedingly implausible. Consider the sentence 'Jack considers Jill fortunate'. According to plausible syntactic views the complement of 'considers' in this sentence is a so-called small clause – 'Jill fortunate'. This clause is not tensed. Assuming competent speakers understand this sentence by understanding their syntactic constituents and the way those constituents are combined, we have evidence that tenseless predication is meaningful.

[5] I am making the controversial assumption here and in the rest of the paper that some inferences are analytic in the sense that an adequate semantic theory entails that they are truth-preserving. Most semanticists believe in analyticity in this sense. For example, it is widely believed that an adequate semantic theory of English should entail that the inference 'Bill walks and Jill talks; therefore Jill talks' is valid. (For the record: I think this inference is lexically valid – i.e. valid in virtue of the meaning of the English word

'and'. Lexical validities are not accounted for by the combinatorial component of the semantic theory. But there are other inferences that are structurally valid – i.e. valid in virtue of the syntactic structure of the sentences involved. A good example of a structurally valid inference is 'Bill walks fast; therefore Bill walks.')

[6] Note that the problem cannot be circumvented by adopting the doctrine that Socrates instantiates certain properties when he does not exist. (The doctrine which excludes this on general grounds – i.e. the claim that it is never the case that something has a property at a time when it does not exist – is often called serious presentism. The term serious actualism was introduced by Plantinga (1983) for the modal analogue of this claim.) The doctrine (coupled with reasonable semantic assumptions) could be used to deny the validity of the inference from 'Socrates was bald' to 'there is someone who was bald' but not to 'there **is** someone who was bald.'

[7] Some deny that 'Sherlock Holmes' is an empty name and claim that it refers to a fictional character; they would maintain that (6) is valid. 'Sherlock Holmes does not exist', 'There is no Sherlock Holmes', 'Nothing whatsoever is identical to Sherlock Holmes' are then false, unless we insist on otherwise unmotivated ambiguities. I assume that those who find such views attractive (the list does not include me) will concede that presentists are within their right to treat names that purport to refer to merely past entities analogously. Of course, they should not say that 'Socrates' refers to a fictional character – they should rather say that it refers to a past character. Past and fictional characters are created by those who discuss them; the main difference between them is that fictional characters usually have a single privileged discussant, called 'author'. But this is not an ontologically significant difference.

[8] One could try to argue against presentism as follows. "According to Millianism, the meaning of a proper name is its referent. According to the presentist, the name 'Socrates' does not refer. But everyone agrees that the name 'Socrates' did refer. So, according to the presentist, the name lost its reference, and hence, its meaning. But, obviously, the name still has a meaning. So presentism is false." Of course, an alternative conclusion might be: "So, Millianism is false."

[9] The argument from names is sometimes voiced in terms of singular propositions. It is said that we can have a belief whose content is a singular proposition that includes Socrates himself as a constituent but cannot have a belief whose content is a singular proposition that includes Santa Claus himself. But I don't know why one would think this, unless one is already convinced that Socrates **exists** but Santa Claus **doesn't**. When debating presentism one can hardly beg the question more blatantly.

[10] I am using a standard tri-partite notation for quantified sentences of the form Q x: [F(x)](G(x)), where the predicate F is the restrictor of the quantifier Q, and the predicate G is the nuclear scope of Q.

[11] Sider (2001) develops versions of the argument from cross-temporal relations that appeals to the need to employ them in physics. As I mentioned in the introduction, I am setting aside arguments involving appeals to what our best science says.

[12] Well, true in the fiction of Greek mythology. I'll write as if that fiction was fact for the sake of simplifying my discussion.

[13] I am playing a bit fast and loose with the notion of present tense correlate here. Two sentences are tense correlates just in case they differ in their tense marking only. Since 'Helen had three husbands' and 'Helen has had three husbands' differ in aspect, it seems

that they would need to have distinct present tense correlates. But the only plausible present tense correlate for both is ‘Helen has three husbands’. I will neglect complications relating to aspect in what follows.

[14] Whether ‘Helen has two husbands’ was true at some time depends on one’s views on the question whether her abandonment of Menelaus annulled her first marriage. If not, Helen lived in bigamy during much of the Trojan War. But since she married Deïphobus only after Paris’s death, she never lived in trigamy.

[15] Lewis (2004).

[16] To say that these have the same sort of logical form does not mean that ‘have’ expresses the same relation in the two sentences. Perhaps it does not. (For the record: I think it does.)

[17] Lewis’s article begins with these words: “Some of our idioms of quantification embed verbs, e.g. ‘there is’, ‘there exists’. When they do, those verbs can be tensed, forming what I shall call tensed quantifiers.” But it is not clear that ‘there is’ or ‘there was’ embed verbs because it is not clear whether these strings really form syntactic units. And even if they do, it is unlikely that they make a quantifier. If ‘there are’ already expresses a quantifier what should we think the word ‘at least five’ does in ‘There are at least five dogs’? Better not to get bogged down in these syntactic debates, if you ever want to get back to metaphysics.

[18] Note that claiming that the notion of possibility at play in (10) is epistemic does not help. There is no sensible epistemic interpretation of ‘could’ that makes (10a) true.

[19] Krifka (1990).

[20] Not everyone believes that the entities counted in the second reading are events. According to Barker (1999) – who follows the lead of Gupta (1980), Carlson (1982), and Nunberg (1984) – they are stages of ships individuated by events of passing through the lock. Barker claims that the stage proposal has an advantage when it comes to cross-sentential anaphora. (12) can be followed by the sentence 'They each tooted their horn when they cleared the last gate.' The truth of this sentence requires four thousand tooting events even if fewer than four thousand individual ships were involved in passings through the lock last year. If 'they' picks out the ship-stages involved in the passings we can explain this. However, as it stands, this is not a problem for the proponents of the event proposal either. We need not assume that 'they' picks out anything – we can simply treat it as a D-type pronoun going proxy for the definite description 'the ships that passed through the lock'. Then the continuing sentence is equivalent to 'The ships that passed through the lock tooted their horn when they cleared the last gate.' The truth of this sentence clearly requires a separate tooting for each clearing of the last gate, and hence, (as long each passing involves a distinct clearing of the last gate) a separate tooting for each passing.

[21] Cf. Davidson (1967).

[22] Contemporary followers of Davidson tend to part ways with him in treating verbs as one-place predicates: 'walk' expresses then not a relation between walkers and their walks but simply a property of the latter. Verbs assign thematic roles to their arguments; thematic roles express thematic relations between the events the verb describes and their participants. So, the fact that the walk is by Bill is expressed through a condition in the logical form saying that Bill is related by the thematic relation AGENT to the walking

event. For elaboration and defense of thematically articulated neo-Davidsonean semantics, see Higginbotham (1985), (1989) and Parsons (1990). Since thematic articulation is not important for my current concerns, in the interest of simplicity I will use Davidson's original analysis.

[23] (14) sounds better if we move 'last year' to a position behind 'twice'. This is because 'last year' is supposed to restrict the domain of the adverb of quantification. It is important to note that although in the case of 'twice' we can neglect this complication (in the interest of simplifying the discussion) we cannot in general think of adverbs of quantification simply as unary quantifiers binding the variable introduced by the verb of the sentence. 'Tai always eats with chopsticks' does not mean all events are eating events by Tai with chopsticks – it means rather that all events that are eating events by Tai are eating events with chopsticks. A reasonable logical form for this sentence would thus be 'always e: [eating (e, Tai)] (with-chopstick(e))'. Similarly, the logical form for (13) and (14) would be '∃e: [(passing (e, the Titanic) ∧ last-year (e)] (through-the-lock (e))' and 'twice e: [(passing (e, the Titanic) ∧ last-year (e)] (through-the-lock (e))', respectively. The bulk of the literature on adverbial quantification is devoted to the question how the restricting clause for the adverbial quantifier is to be determined. For discussion: cf. von Fintel (2004).

[24] I am assuming here – controversially – that the indefinite article is a quantificational determiner. The ambiguity arises with some uncontroversially quantificational determiners as well; cf. 'Most students rarely came to class last year.' Besides the dominant reading, this sentence permits another one, according to which the events of most students coming to class last year were rare. (You get this reading by stressing

'most.' Note that this is also how you get a narrow scope reading for 'every' in 'Every student didn't come to the party.')

[25] Krifka proposes that 'four thousand ships' be interpreted as a predicate that applies to an entity composed of four thousand ships. The syntactic analysis of (12) is [$\varnothing_{Det}$[four thousand ships]]$_{NP}$[pass through the lock]; the zero determiner is ambiguous between an object-related and an event-related interpretation. The latter involves a relation between events and measure properties which holds just in case the event can be decomposed into non-overlapping sub-events whose measures add up to the measure specified by the property.

[26] To implement it, I would need a semantic process whereby the interpretation of 'four thousand' is "delayed". This could be implemented syntactically (e.g. through movement) or semantically (e.g. through complicating the semantic values of sub-sentential expressions). All this would need to be dovetailed with a precise account of how the default interpretation for unarticulated quantifiers takes place.

[27] Milsark (1974). How best to characterize the weak/strong distinction in explanatory terms is a controversial matter – some have connected it to the definiteness/indefiniteness distinction, others to symmetrical/non-symmetrical distinction. The former distinction is equally controversial but the latter is straightforward. A binary determiner D is symmetrical iff for all predicates F and G, DFG is equivalent to DGF. 'No' is a problem case – it is weak but not symmetric. It is sometimes suggested that 'no' decomposes at the level of logical form into negation (taking wide scope) and existential quantification (which is symmetric).

[28] Here are the general definitions. Let $\underline{o}_1,\ldots,\underline{o}_n$ be objects and $\underline{R}$ an n-ary relation, let $\underline{S}$ be the set of all states $\underline{s}$ of objects $\underline{o}_1,\ldots,\underline{o}_n$ standing in relation $\underline{R}$, and for all $\underline{s}\in\underline{S}$ let $\tau(\underline{s})$ be the temporal interval when $\underline{s}$ holds. $\underline{s}$ is maximally continuous iff there is an $\underline{s}^*\in S$ such that $\tau(\underline{s}) = \cup\{\tau(\underline{s}'): \underline{s}'\in S \wedge \tau(\underline{s}')\cap\tau(\underline{s}^*)\neq\varnothing\}$. The definition could rephrased in a tensed language without quantifying over past times and states.

[29] So, 'Bill is happy' cannot be paraphrased as 'there is a state of happiness Bill is in.' The former does, the latter does not entail that Bill is in come maximally continuous state.

[30] Suppose I had the flu and before I could recover I got pneumonia. How many times was I sick? It depends whether 'sick' has a covert argument for a disease. The logical form of 'I was sick with a disease once' (neglecting tense) is, roughly, 'there is a unique (maximally continuous) state $\underline{s}$ such that there is a disease $\underline{o}$ such that $\underline{s}$ is my being sick with $\underline{o}$'. Since no state of me being sick with flu is identical with a state of me being sick with pneumonia, this comes out false in the situation described above. But if 'sick' has no covert argument place for a disease then 'I was sick once' comes out true in this situation. Thanks to Brian Weatherson for raising this question.

[31] I am assuming that 'three' means 'exactly three' not 'at least three'. If you believe that this is false you should replace 'three' with 'exactly three' in (9). Nothing essential changes in the argument.

[32] Parsons (1990):234-5 introduces the twin notions of the resultant state of an event and the resultant state of a state with the following equivalences:

(*) $\underline{e}$'s resultant state holds at $\underline{t} \equiv \underline{e}$ culminates at some time at or before $\underline{t}$

(**) $\underline{s}$'s resultant state holds at $\underline{t}$ ≡ the period of time for which $\underline{s}$ holds terminates at or before $\underline{t}$

The presentist can obviously rephrase these using tense operators. Parsons points out that once a resultant state holds, it holds forever after.

[33] Cf. Barwise and Cooper (1981) for some reasons to think so.

[34] Double counting is ubiquitous and it arises in cases that have nothing to do with tense. Suppose we each buy a book that is supposed to have 120 pages. Mine has a misprint – it contains page 65 twice. Clearly, my book contains 121 pages. But I could say this too: "My book contains 120 pages: page 1, page 2, … page 64, page 65 – twice, page 66, …, and page 120." I think my sentence would be false but would nonetheless convey a truth.

[35] Mark Moyer gave me the following example. Grover Cleveland was president of the United States twice: from 1885 until 1889 and then again from 1893 until 1897. Given this fact, (and that George W. Bush is the 43th president) what should we say about the sentence 'The United States had 42 presidents'? The case is analogous to the one discussed above; so my view predicts that this sentence is literally false, although may be used to convey a truth through double-counting. A number of people I have talked to (including Moyers) believe that the sentence clearly expresses a literal truth.

[36] Let $\underline{o}_1,\ldots,\underline{o}_n$ be objects and $\underline{R}$ an n-ary relation, let $\underline{S}$ be the set of all states $\underline{s}$ of objects $\underline{o}_1,\ldots,\underline{o}_n$ standing in relation $\underline{R}$, and for all $\underline{s}\in\underline{S}$ let $\tau(\underline{s})$ be the temporal interval where $\underline{s}$ holds. $\underline{s}$ is maximal iff $\tau(\underline{s}) = \cup\{\tau(\underline{s}'): \underline{s}'\in S\}$. Like the definition of maximally continuous states, this too could be rephrased in a tensed language without quantifying over past entities.

[37] At first, it might be hard to get the event-related reading. Imagine that someone was spying on Helen last night. He saw three men from Troy kissing Helen but could not identify them in the dark. As it happens, the first and the third were the same. Still, (31) uttered by the spy does have a true reading.

[38] I thank Uli Sauerland for raising this objection.

[39] See Berman (1987), Heim (1990), and von Fintel (2004).

[40] Hume's thesis is suspect anyway. It is plausible that I could not have existed had my mother not existed and me and my mother are surely distinct existences. My point was simply that the presentist doesn't have to reject the thesis just because he accepts tensed states.

[41] For discussion of the truth-maker problem for presentism, see Bigelow (1996), Sider (2001), and Keller (2004).

[42] I thank Berit Brogaard, Matti Eklund, Tamar Szabó Gendler, Peter Ludlow, and Brian Weatherson for comments on earlier versions. Special thanks to Mark Moyer and to Uli Sauerland for raising crucial objections. I also thank audiences at UC Irvine, Oxford, and at the 2006 Milan Meeting at Gargnano for their questions and objections.