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Identity through Change and Substitutivity *Salva Veritate*

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I. Introduction

This paper has three modest aims: to present a puzzle, to show why some obvious solutions aren't really "easy outs", and to introduce our own solution.

The puzzle is this. When it was small and had waterlogged streets, Toronto carried the moniker 'Muddy York'. Later, the streets were drained, it grew, and Muddy York officially changed its name to 'Toronto'. Given this, each premise in the following argument seems true. Yet the conclusion is a contraction.

P1: Muddy York = Toronto

P2: Muddy York evolved into Toronto

P3: The context "___ evolved into Toronto" is transparent, i.e., it allows substitution of co-referring singular terms

P4: It's not the case that Toronto evolved into Toronto

C1: Toronto evolved into Toronto [By P1, P2 and P3]

C2: Toronto both did and did not evolve into Toronto [By P4 and C1]

Of course the puzzle isn't about Toronto. It's not even about cities: the same conundrum arises with names of people (think of the well-known case of 'Cassius Clay' and 'Mohammed Ali'), diseases ('coronavirus' and 'SARS'), and so on. Nor is the puzzle just about evolving into: it can be generated with 'changed into', 'turned into', 'became' and so forth. Generalizing, an instance of the puzzle can be got whenever we have both accidental change – i.e., qualitative change that preserves numerical identity – together with a change in name.

Before moving forward, two caveats are in order. We approach the puzzle as philosophers of language, not as metaphysicians; and our proposed solution to it is linguistic. No doubt the puzzle, being about change, time, identity and the like, also raises metaphysical questions galore; but we take our linguistic points to be compatible with

any remotely plausible metaphysical account of these.¹ Related to this, we do not put forward our solution as definitive. We think it's superior to the "easy outs" that we reject, but it's not without its problems. In particular, it does leave us with one non-obvious metaphysical commitment.

II. Four "Easy Outs"

We now consider four natural reactions to the puzzle.² Each corresponds to the rejection of a premise in the argument above. All four "outs" are initially attractive. We will try to show, however, that in each case, the supposed "easy out" either requires biting a hard philosophical bullet, or suffers from obvious empirical faults.

Start with P1 and P2, since they can be dealt with quickly. Giving up P1 avoids the substitution of 'Toronto' for 'Muddy York' at C1. But to deny that Muddy York is, i.e., is numerically identical to, Toronto, apparently involves giving up the identity over time of the one city. That's a very significant cost, to say the least. It means, for example, that the city's residents didn't truly celebrate Toronto's bicentennial in 1993, since no one thing has lasted that long. One might say: Cities are such fluid social creations that this isn't such a cost after all. But remember: the puzzle generalizes. We mentioned people (and diseases). Thus rejecting P1 means, for instance, that one can't really punish the very person who did the crime, after a name-change, but only some *other* person who stands in the right causal-historical relation to the renamed evil-doer. We could equally have given examples of land-masses, species, etc. And so on. It seems, then, that for any changing object which has different labels at the different times, we'd have to abandon identity. Of course some philosophers might be tempted to give up genuine identity over time. But this just is bullet-biting, and we think that can be avoided. Giving up P2 doesn't look any more promising. It seems a matter of historical fact: Muddy York evolved into Toronto. (You can look it up, if you don't believe us.) You might object that given P4 and P1, we simply have to reject P2. But again, that's another bullet: this move lets metaphysical scruples trump seemingly obvious empirical observations. We hope to show that all such moves can be avoided.

Abandoning P3 seems a far more attractive option. In fact, when we first noticed the puzzle we thought we had found a new kind of opacity, similar to 'The temperature is

rising; the temperature is 92 degrees; so, 92 degrees is rising'. Careful reflection convinced us, however, that '___ evolved into Toronto' behaves differently from familiar opaque contexts. First, in familiar opaque contexts one can substitute genuinely non-denoting definite descriptions and get truths. For instance, because 'is looking for' is opaque, it can be *true* that an (unfortunate) mathematician has devoted his life to looking for the largest prime. But only genuine denoting terms can give rise to true substitution instances of '___ evolved into Toronto' and the like, so that context doesn't behave like genuinely opaque contexts do. It may be objected to this test that we do say things like 'Saint Nicholas evolved into Santa Claus'. But when this is true, the expressions *do* have some kind of denotation, so they aren't really genuinely denotation-less. (To see this, note that when we are using 'Saint Nicholas' in this way, it's also true that he has a beard, is over 20 years old, etc.) It's expressions of the genuinely non-denoting kind, like 'the largest prime', that distinguish genuinely opaque contexts from others – and they do not give rise to true instances of '___ evolved into ___'. Second empirical difference. It seems that evolving into *etc.* is something the object considered in itself does: it's not a guise, or a linguistic description, which determines whether the thing evolved into such-and-such or didn't. And being *de re* in that way is another hallmark of referentially transparent contexts. Third, appeal to opacity is insufficiently general. Similar sorts of things happen where there is no triggering verb at all. Consider, in this regard, a much older and more familiar puzzle: 'That cute baby is that old geezer. That old geezer has a beard. Therefore, that cute baby has a beard'. The problem *here* surely is not that '___ has a beard' disallows substitutivity *salva veritate*. So, if we can find a solution which covers this old case and also solves our puzzle, that would be preferable. Finally, opacity should not be introduced without necessity. Whatever mechanism one endorses to explain away non-substitutivity – reference shift, parataxis, etc. – that mechanism should be deployed sparingly. And, as will emerge below, there's no need to posit opacity here. So much, then, for solving the puzzle by rejecting P3. That's not really such an "easy out" either, because it is empirically inadequate.

The final "easy out" is to reject P4. To give up P4, one can follow Jennifer Saul, and suggest that while it is very odd to say that Toronto evolved into Toronto, it's not actually false. The comparison here, drawn from Saul (1997), is with (1) and (2):

1. Superman went into the phone booth and Clark Kent came out
2. Superman went into the phone booth and Superman came out

She suggests that if (1) is true, (2) is true as well. (How could it not be, since ‘__ came out of the phone both’ is patently transparent?) Still, despite this, we *hear* the two sentences as having different truth values... because of pragmatics. Ditto, one might say, for ‘Toronto evolved into Toronto’ versus ‘Muddy York evolved into Toronto’. The key difference with our puzzle, however, is that while sentence (2) can *be true*, and would even *strike us as true* (e.g., if the famous gentleman went in with his cape on, and came out the same way), ‘__ evolved into __’ is irreflexive. No object can evolve into itself, and under no circumstances does it strike us as true that one does so.³ (Though see below for some complications.) So giving up P4 doesn’t seem consistent with an important fact about the semantics of ‘__ evolve into __’.

To sum up so far, we have presented our puzzle, viz. that premises P1 through P4 seem true, though they jointly yield a contradiction; and we have canvassed four “easy outs”, each corresponding to the rejection of a premise, suggesting that rejecting the premise in question either required biting a philosophical bullet, or was empirically inadequate. The final step, which we turn to shortly, is to present our own proposal. First, however, we need to introduce and defend an idea that will play a crucial role.

III. Polysemy

We maintain that names of places, people and things are polysemous in a way that can solve our puzzle. We will defend this idea in two stages. First, we explain what polysemy in general is. Then, we introduce the particular way in which, according to us, names like ‘Toronto’ are polysemous.

Polysemy is a kind of ambiguity, but one which is less problematic than homophony, as in ‘bank [of a river]’ and ‘bank [where I have my checking account]’. Polysemy understood broadly is a matter of numerous related senses – with theorists differing on what it is to have different “senses”. However implemented, polysemy is systematic enough that it doesn’t postulate hard-to-acquire unrelated meanings. (See Apresjan 1974, Moravcsik 1998, and Pustejovsky 1998 for detailed discussion.)

Here are a series of examples. Sometimes a product name refers to the model, but in other uses it refers to a token thereof. Thus consider (3).

3. Rob's Ford is reliable

One can use this sentence to say, about the kind of Ford Rob owns, viz. the Focus, that it's reliable. Such a statement would be false: the Focus is notoriously unreliable. But consider a context in which Rob owns two cars, a peculiarly unreliable Honda and a Focus which, against all odds, is very reliable. Then, even if the *kind* of Ford Rob owns is notoriously unreliable, one can still speak truly with (3). This sort of example supports the idea that the phrase 'Rob's Ford' is polysemous, being used here to refer to a type and there to refer to a token. Notice that this doesn't require two independent lexical entries for 'Ford', since the phenomenon occurs with kinds quite broadly: e.g., think of (4):

4. Every Canadian coin has a monarch's face on it

This is true of every denomination, but false of some of the more well-worn metallic tokens. Nor is type/token the only place where "multiplicity of related senses" shows up. Consider these examples, adapted from Pustejovsky 1998 and Nunberg 1979, 1995.

5. 'Denny's is located on the corner of 5th and Broadway' versus 'Denny's once had controversial hiring practices'

6. 'Mary broke the bottle' versus 'The baby finished the bottle'

7. 'The window is rotting' versus 'Mary crawled through the window'

8. '*The Toronto Star* fired its editor' versus 'John spilled coffee on *The Toronto Star*'

9. 'Saul Bellow died recently' versus 'Saul Bellow would make a terrific dissertation topic'

10. 'Washington is a great tourist destination' versus 'Washington declared war'

In (5), the shift is something like token/type: from a particular location to the corporation as a whole. In (6), 'the bottle' shifts from standing for the container, to standing for its contents and in (7), 'the window' similarly shifts from the outside to the inside. In (8) and (9) one refers first to the producer, then to (something like) the product. Finally, in (10) 'Washington' is used first to refer to the city as a location, then to refer to it as seat of government. (Compare also: 'Washington beat the Maple Leafs to win the Stanley Cup'.)

Again, in contrast with the homophonous ‘bank’ [river versus financial institution], one doesn’t have to memorize two autonomous meanings for the specific terms ‘bottle’, ‘window’ and ‘*The Toronto Star*’, etc. What the language learner needs to internalize is that there is a comparatively systematic effect of multiple senses that applies generally to models, containers, figures, and products. (Among other cases.) *That* is polysemy.

Before laying out in more detail our polysemy idea for names, it may help to foreshadow how appeal to polysemy would solve the puzzle. Recall the ‘Rob’s Ford’ example, and consider the following argument which parallels the one we began with:

P1*: The car in the driveway = Rob’s Ford

P2*: The car in the driveway is unreliable

P3*: The context ‘__ is unreliable’ is transparent, i.e., it allows substitution of co-referring singular terms

P4*: It’s not the case that Rob’s Ford is unreliable

C1*: Rob’s Ford is unreliable [By P1, P2 and P3]

C2*: Rob’s Ford both is and is not unreliable [By P4 and C1]

P1* is an identity *at* a time; surely it can’t be denied. P2* is an empirical fact: the 2000 Ford Focus, which is the one that Rob owns, is an extremely unreliable car. It has, for instance, been subject to a record number of recalls. As for P3*, if ‘__ is unreliable’ is opaque, then just about anything is. As for P4*, it’s an empirical fact too: Rob’s Ford is even more reliable than his Honda, and Hondas are one of the most reliable cars on the road. We thus have four premises which seem true, and a conclusion that is a contradiction. Should we bite the bullet, and reject one of the premises? Clearly not. In this case, it’s quite obvious what is wrong with the argument: on the sense of ‘Rob’s Ford’ on which P1* (and P4*) are true, viz. the token sense, P2* is false; and on the sense of ‘Rob’s Ford’ on which P2* is true, viz. the model sense, P1* (and P4*) are false. The trouble with the argument, then, is that its premises seem true because of equivocation on the polysemous phrase ‘Rob’s Ford’.

So much for introducing polysemy as a general phenomenon. That it exists at all is at least somewhat controversial (e.g., Fodor & Lepore 1998 take issue with it), but we think something in the neighborhood is real and ubiquitous, and we’ll assume as much in

what follows. Taking polysemy in general as a given, our idea with respect to the puzzling argument with which we began is that polysemy of an unnoticed sort occurs with names of places, people, etc. In particular, and putting things crudely for the time being, such names have two lexically specified use-potentials: they have the linguistic function both of being used to refer to an object over time, and to that object at a time.⁴ Using ‘Toronto’ as an example, the idea is that the meaning of this name permits two literal uses: to refer to the city as a whole, across its entire history, and to refer to the city at a particular stage of its growth and development.

Two clarifications. First, the idea is not merely that ‘Toronto’ can be used to refer to various things. Of course that’s true, because speakers can in general refer with a word *w* to lots of things that *w* does not designate. Nor, second, is the idea that there is a “meaning” of Toronto for each thing it can be used literally to refer to. Since there are ever so many stages at which Toronto exists, there are every so many ways of referring to Toronto at a time: on July 22nd, 2005; in 1929; on VE day; etc. – and it’s clear that ‘Toronto’ does not have, as a matter of its linguistic job, a distinct use-potential for each of these. Rather the idea, again crudely for now, is that ‘Toronto’ has two relevant senses: one for referring to the object over time, and the other for referring to that object during the contextually salient period of time.

Why think that names for people, places, things, etc. are polysemous in this at-a-time versus over-time way? Let’s start with three points in favour. First, notice that ‘John Graves Simcoe, having died in 1806, lived in Muddy York, not in Toronto’ sounds true. More exactly, we think it can be used literally to make a true statement. But it couldn’t do so if ‘Muddy York’ and ‘Toronto’ could only be used literally to refer to the entire object-over-time. Also, ‘Muddy York is now overrun with SUVs and cookie cutter houses’ sounds true. Or better, we think it too can be used literally to make a true statement. But it couldn’t be so used if ‘Muddy York’ could only be deployed literally to refer to the long ago object-at-a-time. Thus polysemy for such expressions seems to be required on independent grounds: object-at-a-time for the former usage, object-over-time for the latter. Second, the effect is quite general. It’s not just names that are here used literally to talk about objects-at-a-time and are there used literally to refer to objects-over-time. Nominals in general can be used literally with each kind of satisfier. Thus, to take

an example from Ted Sider (p.c.), ‘Some frontier towns evolved into major centers of culture’ can easily be used literally to say something true, unlike ‘Some major centers of culture evolved into major centers of culture’. Or, to take an example from Lenny Clapp (p.c.), one could point at a picture and then at a crusty oldster and say, using a demonstrative rather than a name, ‘That cute baby evolved into that grizzly old codger’. That statement could be true. But ‘That grizzly old codger evolved into that grizzly old codger’? So, introducing polysemy of this kind of names is not *ad hoc*. Third, and speaking of generality, introducing polysemy for referring terms allows us to explain away other apparent examples of opacity. Consider: ‘Lunch is a tuna fish sandwich; lunch is always served at noon; therefore, a tuna fish sandwich is always served at noon’. The premises are true. The conclusion is false. Still, it’s not plausible that ‘__ is always served at noon’ is opaque. But how then is substitution failure to be explained? The obvious answer is that ‘lunch’ is polysemous, being used here for a daily eating activity, there for the item to be eaten on a specific day. Role-occupier cases like this turn out to be quite common. (Here’s another case. ‘The boss is getting younger; Samantha is the boss; therefore, Samantha is getting younger’.) Noting this, consider again the familiar example ‘The temperature is rising’. Our initial thought, following Montague, was that ‘__ evolved into __’ exemplified a variety of opacity along these lines. We were wrong about the opacity of ‘__ evolved into __’. But maybe we were right about the similarity. Perhaps what’s going on in this more familiar example is not that ‘__ is rising’ is resistant to substitution of co-referring terms -- with the “functional sense” being contributed instead of the usual referent -- but rather that ‘The temperature’ is polysemous: here it is used to refer to the role, there it is used to talk about the present occupier (e.g., 22 degrees). In other words, co-referring terms *can* be substituted in this context; the thing is, ‘The temperature’ when used to pick out the role, *doesn’t* actually co-refer with ‘22 degrees’.⁵

Consider now four objections to our polysemy hypothesis for ‘Toronto’ *et al*, and our replies. First, introducing multiple senses will strike some as a violation of “Grice’s razor”: not to posit ambiguities without necessity. One obvious reply is that there *is* necessity here, because there are usages that cannot be adequately described without varying senses. Though we think this reply carries some weight, we recognize that such a

response will seem question-begging in the present context. Another reply, then, which skirts the necessity issue, is this. Polysemy can be understood in at least two ways. On the first, polysemous terms are assigned a *series* of contents, and context selects among these. So understood, polysemy really is full-blown ambiguity, so, for better or worse, this version does introduce extra type meanings. Happily, there's another way of spelling out the idea. On the second version, the polysemous term is assigned a single content which can permit literal reference to something more determinate on the basis of the context. To give an example, on the first account 'Ford' would mean both FORD MODEL and FORD INSTANCE; then a use of 'Rob's Ford' would exhibit one of these two pre-set senses. On the second account, 'Ford' would simply mean FORD; but that content would not single out tokens or types as what could be literally referred to, allowing a speaker to refer literally to either. The phrase would thus have both use-potentials determined by its one standing meaning -- not because it had two meanings. The cost of the second approach, if it is a cost, is that the sentence type 'Rob's Ford is unreliable' would not express a context-independent proposition. Indeed, it's consonant with this approach that sentence types in general do not have propositions as their meaning. Rather, as per Strawson 1950, their meaning allows them to be used by agents to state various propositions. The benefit is that this one sentence could be used literally to assert (at least) two quite different kinds of propositions, thereby accounting for the observed usage. For reasons of theoretical economy, and for other reasons that are quite independent of the puzzle, we happen to favor the latter option. And *it* isn't open to the objection under consideration, whether or not additional senses are required to describe the data correctly.

Here is a second objection, due to Mark Moyer (p.c.). Consider sentence (11).

11. Muddy York evolved into Toronto, and **its** bicentennial was in 1993

On our view, 'its' would have to refer to the object-over-time, since that is the thing that survived for 200 years, but the only antecedents available each would be used to refer to the object-at-a-time, since it is those that "evolve into". Thus, our view seemingly predicts that (11) will be semantically anomalous. But, continues the objection, the sentence is perfectly fine. Hence, there must be something wrong with our analysis. Our reply is that polysemous terms in general just do behave this way: an anaphor doesn't

always pick up the exact “sense” of its antecedent. For instance, take ‘Rob’s Ford has won *Car and Driver*’s Ten Best award five years in a row, but this morning **it** won’t start’. The antecedent can be about the type while the anaphor is used to refer to the token (otherwise, every literal use of the sentence would be false). Yet we shouldn’t conclude that ‘Rob’s Ford’ isn’t polysemous. Here are some other nice examples, from Nunberg:

12. Yeats did not enjoy hearing **himself** read aloud

13. The window was broken so many times that **it** had to be boarded up

14. Tom sat down to read *The New York Times*, which minutes before had fired **its** president

15. After drinking all three bottles, Scott smashed **them** against his head

In short, the peculiar anaphoric behavior of ‘its’ in (11) does not provide evidence against ‘Muddy York’ and ‘Toronto’ being polysemous in the suggested object-at-a-time versus object-over-time way.

Third objection, due to Jill Rusin (p.c.). It’s an obvious feature of our view that Ray could speak truly in saying (16):

16. Toronto did not evolve into Toronto

The truth of this statement is precisely part of what gets the puzzle going. A less obvious, and potentially problematic feature of the view is that Rob could speak truly in saying (17):

17. Toronto did evolve into Toronto

That’s because, on our account, ‘Toronto’ is not just polysemous, it is also context sensitive in another sense. Like ‘he’, ‘Toronto’ can be used on its at-a-time sense to refer to the city at different times. Thus the first ‘Toronto’ in an utterance of (17) might be used to refer to the city on the day of its founding in 1793, and the second might be used to refer to Toronto on VE day. So used, the speaker (say Rob) states something true with this sentence. (Compare ‘That evolved into that’: it is overtly context sensitive, and it can be used to say something true, by demonstrating first the little town and then the metropolis.) But, continues the objection, if Ray can speak truly with (16) and Rob can speak truly with (17), it seems that one could use (18) truly as well:

18. Ray said that Toronto did not evolve into Toronto, and Rob said that Toronto did evolve into Toronto and what they both said is true.

But, and here is the nub of the objection, (18) just can't be used truly. This counts against our view that 'Toronto' can shift its reference: it doesn't behave like authentic reference-shifters such as 'he'. The argument is clever. Our reply, however, is that once the context is right, one *can* use (18) truly. For instance, Ray could speak normally, while Rob could say the first 'Toronto' in a small quiet voice and the second loudly and with enthusiasm. Ray would then have spoken truly, about the object-over-time, and Rob would have spoken truly about the object at distinct times – e.g., speaking truly about the evolution of Toronto the small reserved town into Toronto the vibrant multiethnic mega-city. Deploying (18) would, it must be granted, typically be an odd way of reporting this event, but that doesn't mean it cannot be used to speak the truth. Besides, imagine both the speaker and addressee have had the benefit of reading the present paper, and the speaker wants to remind the addressee about the view. Then, the speaker could say (18), speak truly, and speak felicitously!⁶

The final objection is that our view is metaphysically untenable. In particular, goes the objection, our "solution" introduces time slices, or temporal parts, or something like that. This is problematic on a host of fronts. For instance, it's unclear how such slices/part relate to ordinary objects, and it's unclear how an early time slice (or part) can evolve into a later one, since the former has ceased to exist by the time the latter comes onto the stage. Our reply is that our view has no such implication, and this in two senses. First, the appeal to polysemy is about natural language semantics; it simply is not about metaphysics in and of itself. So we certainly do not intend any controversial metaphysical commitments. Second, so far as we can tell, our semantic claims do not entail any one view about the metaphysics of objects at a time versus objects over time. That's because all our view requires is:

- a) That people can refer to an object at a time;
- b) That people can refer to an object over time;
- c) That there is some difference between doing these two things;
- d) That objects at a time "evolve into" (whereas objects over time "evolve")

Any metaphysics consistent with (a)-(d) is fine by us, and there are surely lots of metaphysical views that can endorse these.

We would add that any *plausible* metaphysics has got to be consistent at least with (a)-(c), because they are patently true. Starting with (a) and (b), one can, for example, refer now to Elton John at the moment that *Goodbye Yellow Brick Road* was released. Indeed, we just did. One can also refer to Elton during his entire life. We just did that too. As for (c), that there's some difference is clear from the fact that Elton on the release date, way back in 1973, has different kinds of properties from Elton over time. For instance, Elton at the moment the album was released had a height and weight, whereas Elton over time only has an *average* height and weight; Elton at the moment the album appeared in stores was surely wearing a certain pair of glasses, whereas Elton over time has worn many, many different pairs of glasses, and so on. And, of course, whereas the man over time has two names, 'Elton John' and 'Reg White', the man at the time of his birth had only one name, namely 'Reg White'.

The sticking point is (d). In particular, it's not obvious that what one refers to when speaking of (say) Toronto at a time, is a *thing* at all, let alone a thing that "evolves into". Now, granting this, we don't immediately have to buy any specific metaphysical story about what an object at a time is, such that it can evolve into: whatever the right story is, we can endorse it. Still, *that we can refer to such a thing* does seem to be a (metaphysical?) commitment of our view. As hinted at the very outset, this is a consequence we are a bit uneasy with. Still, it's better than the obvious bizarre bullets that must be bitten, if P1 or P2 is abandoned. That, then, is the minor bullet that we bite.

IV. Using Polysemy to Solve the Puzzle

Our proposal is that the names of places, people and things are polysemous. In particular, they permit literal reference either to the object over time, or to the object at a time. We gave three arguments for this idea, and responded to four arguments against it. What remains is to put the proposal to work, to solve the puzzle with which we began. The game plan is to explain, for each premise, how it turns out to be true without yielding the contradictory conclusion. Along the way, we also want to highlight an insight that lies behind each of the "easy outs".

Start with premises three and four. P3 is plain true: '___ evolves into ___' just does apply to the object however conceived. What was right about rejecting it, however, was

the insight that there is reference-shifting going on. But, on our view, the reference shifting isn't of the sort Frege envisaged, i.e., the kind triggered by an opaque context. Instead, it's merely a matter of one of the two use-potentials of a polysemous name (viz., the at-a-time one) being salient because the linguistic context (namely, '___ evolves into') pragmatically calls for that kind of referent. As for P4, it is true when 'Toronto' is used to refer univocally to the object over time. It is also true when 'Toronto' is used univocally to refer to the object at the same time. The insight we can glean from the Saul-style strategy, rejected in §II, is that pragmatics can play an unexpected role, namely to explain why one can use 'Toronto evolved into Toronto' truly, to talk of an object at different times. (E.g., 'toronto evolved into TORONTO'.)

Turning to premises one and two, we come to the heart of the solution to the puzzle. P1 is true when 'Muddy York' and 'Toronto' are both used to refer to the object over time. Nevertheless, and this is an insight of the first "easy out", P1 is false on another reading: the one where the two names are used to talk about distinct objects at a time. As for P2, it is true when 'Muddy York' and 'Toronto' are each used to refer to the city at different times. The insight of the second "easy out" is that P2 is false on another reading, namely where both names are employed to refer to the city over time. Crucially, P2 is false on the reading in which P1 is true, and P1 is false on the reading on which P2 is true. There is thus no way to make all the premises true. That's why the argument fails.

But why do we not notice the slide? For instance, why is the argument using P1-P4 so much more puzzling than the argument which uses P1*-P4*? (No one would be even initially fooled by the latter.) The answer, we think, is that P1 and P2 each have exactly one *salient* reading: it's wholly natural to read P1 as only being about the object at a time, and wholly natural to read P2 as being only about the object over time. And so read, they are both true. Thus the polysemy does not jump out at us. It takes hard work to see that P1 can also be used to talk about the early waterlogged city versus the modern metropolis -- and that the statement so made would be false, because those are not numerically identical. And it takes hard work to realize that P2 can be used to talk about the single city throughout its history -- and that the statement so made would be false, because that object didn't evolve into Toronto. (It *is* Toronto.) Once the work has been done, however, we think the original argument loses its forces.

The solution, in sum, is that all the premises seem true because they all *are* true... on their most salient reading. Thus the right approach is not to reject any premise on its most salient reading: that only leads to bullet-biting or predictions that aren't empirically borne out. The problem, rather, is one of equivocation: 'Toronto' is being used one way in P1, and a different way in P2.⁷

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¹ On the other hand, we don't mean to suggest that our proposal is neutral to any metaphysical theory about change. If Endurantism, for instance, really does entail that one cannot talk about the young George Washington who chopped down a cherry tree but only about Washington over time, then so much the worse for it. If, in contrast, Endurantism can allow for talk about objects-at-a-time and objects-over-time, then it is consistent with our approach. One who thinks that our view begs certain metaphysical questions must be assuming that linguistic referential acts are successful only if the objects of those acts exist (in the metaphysically loaded sense at work here). We are not

committed to that assumption. We are, though, committed to a more modest but true claim, namely, that we have a linguistic ability to refer to all different kinds of things.

² One solution that we will not consider is the meta-linguistic solution: the name, ‘Toronto’, is used non-literally in P2 although P2 is used literally to assert a historical truth – P2 means something like, ‘Muddy York became known as ‘Toronto’’. We won’t consider it because it is not an “obvious” out to the puzzle. For one thing, there is no semantic hint of anything meta-linguistic about P2, and thus, there is no plausible reason for advancing that reading. (For a defense of a meta-linguistic view of the semantics of proper names, see Bach 1987 and Katz 1990. Kent Bach later revised his view in Bach 2002.) For another, P2 is not necessarily extensionally equivalent to the corresponding meta-linguistic reading for familiar Kripkean reasons, assuming that names for cities are rigid designators. Thus, they are not semantically equivalent in meaning.

³ Some metaphysicians will beg to differ. For example, Endurantists will take P2 as being semantically trivially true (if P1 is true) or trivially false (if P1 is false). Furthermore, they will take sentences of the form, ‘x became F’, as being the primary form of expression of change-over-time, where ‘F’ is a descriptive predicate, and contend that such sentences are true just in case the object in question lacks F at some time and is F at some later time – it is numerically one and the same object (over time) that changes its properties. The idea is to treat P2 as being semantically equivalent in meaning to ‘Muddy York became Toronto’, and then specify the truth-conditions of the latter in a manner that doesn’t countenance distinct objects-at-a-time as relata. Without getting embroiled in a metaphysical debate, we only wish to point out that, on the present proposal of understanding change, P2 entails that Muddy York evolved into *itself* given the truth of P1. If ‘evolved into’ is reflexive, then it follows that Muddy York evolved into itself only if there is a single object (over time) that at one time wasn’t self-identical but which (that very same object over time) is self-identical at some later time. Given the choice between accepting this rather bizarre result and accepting the claim that ‘evolved into’ is irreflexive, we will gladly opt for the second. We don’t deny, of course, that Muddy York *qua* object-over-time has been evolving. We do, however, think that it is

very important to distinguish the process of evolving from the relation of \underline{x} evolving into \underline{y} . (See footnote 6).

⁴ Putting the point in this crude way is helpful because it shows that we are not claiming that ‘Toronto’ refers to objects-at-a-time primarily and to an object-over-time only derivatively, or vice versa. Quite the contrary: we think that both use-potentials are semantically on par, which is consistent with the view, developed below, that ‘Toronto’ has a single semantic meaning that underdetermines what a speaker means to be referring to with ‘Toronto’ in different contexts of use.

⁵ We are by no means alone in blaming the nominal, rather than the predicate, for the failure of substitution in ‘The temperature is rising’. We aren’t exactly sure who noted the point first, but it goes back at least as far as Michael Bennett and Barbara Partee’s work in the mid-Seventies.

⁶ It’s interesting to compare in this regard ‘Toronto evolved into itself’ versus ‘Toronto evolved into Toronto’. Putting aside “proxy readings” -- such as Ringo Starr bumping into a wax figure of the Beatles’ drummer, described as ‘Ringo Starr knocked over himself’ -- we find the former much worse than that latter; and this fits with our view that ‘Toronto evolved into Toronto’ can be used to talk about one thing evolving into another. (See Jackendoff 1992 for discussion.),

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