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The Puzzle of Dion and Theon Solved

H. E. Baber[1]

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Abstract

Dion is a human person, Lefty is his left foot, and Theon is Lefty-Complement, a proper part of Dion. Lefty is annihilated and Dion survives left-footless. After Lefty's annihilation Theon, if he survives, occupies the same region as Dion. I suggest that this scenario be understood as a fusion case in which Dion and Theon, initially overlapping but distinct, are identical after Lefty's annihilation and propose an account of proper names that allows us to say that Dion and Theon have 'become identical' without commitment to occasional identity or other controversial metaphysical doctrines. The proposed solution employs the semantics developed by Wolfgang Schwarz to address the 'paradox of occasional identity', posed by puzzle cases of fission, to deal with the problem of Dion and Theon, a body-minus puzzle.

Keywords Identity · Persistence · Fission · Fusion · Names · Counterparts

Dion is a human person, Lefty is his left foot, and Theon is Lefty-Complement, a proper part of Dion. Lefty is annihilated and Dion survives left-footless. Theon exists after Lefty's annihilation too. Dion and Theon were not identical before the annihilation of Lefty so, since identity is not 'occasional', they are not identical afterwards, even though they then have the same material parts and exactly occupy same region—an unpalatable result.

I suggest that the Dion-Theon scenario should be understood as a puzzle case of fusion which, like other branching cases of fission and fusion, can be resolved

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without metaphysical cost if we adopt a semantics on which names are temporally flexible and, at times, multiply denoting. Identity is not occasional but where referring expressions are temporally flexible identity statements may have different truth values at different times or within the scope of different temporal operators.

1 The Puzzle

At t_1, before Lefty's annihilation, Theon was a proper part of Dion and so was not identical to Dion.

(1) At t_1, Dion≠Theon.

   After Lefty's annihilation Dion and Theon exactly occupy the same region and have all and only the same parts so, commonsensically, they are identical at t_2.

(2) At t_2, Dion=Theon.

   Identity, however, is not *occasional*[1]: since Dion and Theon were not identical at t_1, they cannot be identical at t_2.

(3) At t_2, Dion≠Theon.

1.1 Contradiction!

(1) is uncontroversial so either (2) or (3) is false. I suggest that it is (3) that should be rejected since (2) is both intuitively correct and, arguably, impossible to avoid without taking on philosophically contentious assumptions.

2 Desiderata for a Solution

The puzzle of Dion and Theon is one of a range of puzzles concerning the identities of spatio-temporal objects, including problems of material constitution and diachronic branching. Ideally, solutions to such puzzles should be, insofar as possible, (i) commonsensical, (ii) metaphysically innocent, and (iii) generalizable to puzzles involving objects of different kinds and to other identity puzzles in the vicinity.

(i)   Commonsensically, both Dion and Theon exist before and after the annihilation of Lefty and are not identical before Lefty's annihilation but are identical afterwards. A number of writers, however, including Chrysippus who first proposed

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[1] The occasional identity thesis proposed Gallois (1998) is highly controversial and, it has been argued, metaphysically loaded. Sider (2001), for example, argues that it is incompatible with the B-theory of time.

the puzzle, have held that Theon does not exist after the annihilation of Lefty.[2] The solution to the puzzle case of Dion and Theon I propose comports with commonsense, according to which both Dion and Theon exist before Lefty is annihilated, survive Lefty's annihilation, and are identical afterwards.

(ii) Some solutions to the puzzle of Dion and Theon are committed to controversial metaphysical assumptions. Arguably, even if there are independent, philosophically compelling reasons to deny the existence of artifacts, composite objects generally, or arbitrary undetached parts of objects, or to endorse four-dimensionalism, a solution to the puzzle should, insofar as possible, avoid commitment to philosophically contentious doctrines. The solution I propose is metaphysically innocent.

(iii) Finally, some solutions to the puzzle of Dion and Theon are not generalizable to comparable problems that arise for ordinary objects of other kinds.[3] The body-minus puzzle posed by the Dion-Theon scenario however arises not only for persons or other organisms but for artifacts that lose parts. The solution I propose is applicable to problems posed by the identities of ordinary objects of every kind, including both body-minus puzzles and puzzles posed by other cases of fission and fusion.

According to the account proposed here the puzzle of Dion and Theon should be understood as a fusion case: Dion and Theon, initially distinct though overlapping become identical upon Lefty's annihilation; (1) and (2) are true but (3) is false. Identity is not occasional, but identity statements may have different truth values at different times when names denote different individuals at different times. The proposed solution takes a page from the exdurantist account, according to which names are temporally flexible and elaborates the associated counterpart-theoretic semantics but avoids commitment to 4-dimensionalism and the exdurantist doctrine that objects and their counterparts are instantaneous stages.

3 Fusion

The Dion-Theon scenario understood as a fusion case is a story in which two things 'become' one. Dion and Theon who, though initially overlapping, are not identical, become one person when Lefty is annihilated.

Branching cases of fission and fusion are logically problematic for familiar reasons. Suppose an object, x, has survived fission to 'become' distinct objects x_1 and x_2. We say that after fission x is x_1 and that x is x_2.

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[2] Other writers, including Peter van Inwagen (1981) and Eric Olson (2006) hold that neither Theon nor Lefty existed either before or after Lefty's annihilation. Carmichael (2020) argues that though Lefty existed while he was an undetached part of Dion, Theon did not exist either before or after Lefty's annihilation. Burke (1994) and, more recently, Moran (2018), argue that Theon existed before Lefty's annihilation but not afterwards.

[3] The accounts proposed by Olson and Carmichael each appeal to Dion's status as an organism—in Olson's case, to his status as an organism that is metaphysically privileged in virtue of being the sole thinker involved in the case.

(4) $x=x_1 \land x=x_2$.

x_1 and x_2 are not identical:

(5) $x_1 \neq x_2$.

(4) and (5) however entail a contradiction. Identity is Euclidean so.

(6) $(x=x_1 \land x=x_2) \rightarrow x_1=x_2$.

And, from (4) and (6), (7) follows, contradicting (5):

(7) $x_1=x_2$.

This is an instance of what has been called 'the paradox of occasional identity'. If, at any time, objects o_1 and o_2 are identical then they are identical at every time. But *prima facie* in branching cases things that are not identical at one time are identical at another time. Where fission occurs it appears that objects which are identical become distinct. Where fusion occurs objects which are not identical become identical, as is the case for Dion and Theon. Before Lefty's annihilation Dion and Theon, though they overlap spatially, are not identical. Afterwards, on the most intuitive reading, they are.

Nevertheless, even though objects that are distinct cannot become identical, identity statements have different truth values at different times when they involve temporally flexible referring expressions. If at some time t, the names 'a' and 'b' refer to o_1 and o_2 respectively, but at another time, t', both refer to the same object, then '$a=b$' is false at t but true at t'. Ordinarily, names are temporally rigid. However, on some accounts, in branching cases of fission or fusion, names refer to different individuals at times before and after branching.[4] 'a' and 'b' therefore may refer to distinct objects before fusion but to the same object afterwards.

4 Counterpart-Theoretical Semantics for Branching

To deal with the paradox of occasional identity arising in fission cases Schwarz (2014) has developed a counterpart-theoretic semantics to account for the way that reference shifts in branching cases which, in an off-label use, can be exploited to solve the Dion-Theon puzzle. On this account, we distinguish a sentence's *time of utterance* from its *time of evaluation*. The latter is indicated by temporal operators that shift the time of evaluation and with it the reference of singular terms within its scope to its initial referent's counterpart at that time. So, where x's post-fission counterparts are x_1 and x_2, the reference of 'x' in contexts indicating post-fission times of evaluation shifts to x_1 and x_2, so that at those times 'x' is multiply referring.

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[4] Vide, e.g. Perry, 'Can the Self Divide?', *Journal of Philosophy*, 1972.

What are an object's counterparts? For that matter, what is an object? According to the stage theory, ordinary objects and their counterparts are instantaneous stages. The counterparts of an object of a kind, K, are K-stages that bear the counterpart relation for K to it: the relation that holds on stages that we understand to be the 'same K'. On the purdurantist account an ordinary object of a kind, K, is a maximal K-unity-related aggregate of stages. And, on one plausible version, at any time, t, a K object's counterpart at t' is an aggregate of K-stages consisting of a stage at t' that is K-unity-related to its stage at t and all stages that are K-unity-related to that stage at t'.[5] In an endurantist framework, where ordinary objects do not divide into temporal parts, counterparthood is defined in terms of a unity relation understood to hold on persisting objects at different times rather than on stages that exist at different times. Schwarz argues, compellingly, that his counterpart-theoretic semantics is compatible with any of these ways in which objects and their counterparts are understood and hence that, to this extent, his solution to the paradox of occasional identity is metaphysically innocent.

According to the proposed counterpart-theoretical semantics, at any time of utterance, t, 'Fx' is true at t' iff a counterpart of x at t' is F. '$x=y$' is true at t' just in case there is a counterpart assignment on which 'x' and 'y' denote the same object at t'. Given this counterpart-theoretic semantics (4), (5), and (6) are incomplete and must be temporally qualified as.

(4*) at t_2, $(x=x_1 \wedge x=x_2)$
(5*) at t_2, $x_1 \neq x_2$.
(6*) at t_2, $((x=x_1 \wedge x=x_2) \rightarrow x_1=x_2)$

A standard rule of hybrid logic, which introduces temporal operators like 'at t_2' above, is *at-generalization* according to which when a formula A is true then so is *at t, A*. At-generalization however fails for the proposed counterpart-theoretic semantics on which terms may be multiply referring—as they will be in branching cases of fission and fusion—so that while (6) is a logical truth, (6*) is false if x_1 and x_2 are distinct counterparts of x at t_2.

Where x fissions to *become* (as we should say) x_1 and x_2 at t_2, x has two counterparts at t_2 denoted by 'x_1' and 'x_2' respectively. Before fission, at t_1, x_1 is x_2. Even if the names, 'x_1' and 'x_2' are not then in use (unless x has issued a pre-fission baptismal directive) there is a counterpart assignment on which they denote the same object, viz. x, at t_1 so, 'at t_1, $x_1=x_2$' is true. Within the scope of 'at t_2', the time of evaluation shifts to t_2 at which time an occurrence of 'x' denotes x_1 on one counterpart assignment and x_2 on another'.[6] At t_2, therefore, '$x=x_1$' and '$x=x_2$' are each true *on different counterpart assignments*. There is, however, no counterpart assignment on which x_1 and x_2 denote the same object at t_2 so at t_2 '$x_1=x_2$' is false. At t_2, after fission, x_1 is x and x_2 is x, but x_1 is not x_2—the intuitively correct result in a case of fission where x 'becomes' x_1 and x_2. After fission, 'x' is multiply denoting: the apparent inconsistency

[5] This is the account Perry (1972) proposes to accommodate fission cases. Where an object undergoes fission it's stage s at any pre-fission time, t, will be unity-related to two stages, s_1 and s_2 at any post-fission time, t' and will, therefore, have two counterparts at t': the aggregate of all and only unity-related stages that include s and s_1 but not s_2 and that which includes s and s_2 but not s_1.

[6] Schwarz, 2014: 1067.

in holding both that x is x_1 and x is x_2 but x_1 is no$t$ x_2 therefore 'can be explained as the effect of a harmless semantic phenomenon akin to ambiguity'.[7]

This account addresses the paradox of occasional identity that arises from 'standard' branching cases where the following statements are all true:

(i)   At t, there is a single object x of a certain kind.
(ii) At t', there are exactly two objects, x_1 and x_2, of that kind.
(iii) x_1 and x_2 have equal claim to be x.
(iv) At t', x exists and is an object of the relevant kind.

The case of Dion and Theon is however not a standard branching case. On the commonsensical reading of the story there is indeed a single object of a certain kind after Lefty's annihilation, a person, who existed before Lefty was annihilated. Before Lefty's annihilation however there were not two objects of that kind: Dion was a person but, assuming proper parts of people are not themselves persons, Theon was not. Moreover, it is not clear that Dion and Theon have equal claim to be the person who exists after Lefty's annihilation. It therefore remains to be seen whether Schwarz's counterpart-theoretical semantics solves the problem posed by the case of Dion and Theon.

5 Is Schwarz's Counterpart-Theoretic Semantics Applicable to the Case of Dion and Theon?

In branching cases, where objects of the same kind fuse to become a single object of that kind or emerge after fission as objects of same kind as their progenitor 'the same unity relation relates a stage at one time to multiple stages at another time'. Schwarz argues that the semantic solution he proposes for puzzles that arise from branching is only applicable to such 'genuine' cases of occasional identity and not applicable to cases the involve multiple unity relations. (Schwarz, 2014: 1079) Nevertheless, even though the Dion-Theon scenario is in some respects different from 'standard' cases of branching it does not, it will be argued, involve multiple unity relations.

5.1 Multiple Unity Relations

The unity relations that hold on stages of objects at different times are sortal-relative and, whereas Dion's stages prior to Lefty's annihilation are related to later stages by the temporal unity relation for *person* it is not clear that Theon's initial stages are since Theon is not then a person. And where multiple unity relations are involved, Schwarz recommends alternative treatment.[8]

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[7] Schwarz, 2014: 1068. Nevertheless, as Schwarz notes, 'while the case of multiple counterparts is in many ways like a case of ambiguity the analogy is not perfect…What matters for the present point is that both phenomena involve some kind of multiple denotation.' For a fuller account of multiple denotation as it figures in his proposed counterpart-theoretical semantics see Schwarz pp. 1077 ff.

[8] I am grateful to the anonymous for bringing this to my attention.

Schwarz cites the case of Goliath and Lumpl as one in which multiple unity relations are involved. A statue of Goliath and Lumpl, the lump of clay from which it was formed, exactly occupy the same region. However, while Lumpl persists because the unity relation for *lump* holds on clay-stages both before and after Goliath is formed, Goliath persists in virtue of the unity relation for *statue* holding on later clay-stages which he shares with Lumpl. Even when they coincide, Goliath is a statue, Lumpl is a lump and, Schwarz argues, they are not the same *anything* that would undermine their non-identity.[9] Cases of material overlap where multiple unity relations are involved, Schwarz argues, are not amenable to the counterpart-theoretic treatment he proposes for branching cases that involve objects of just one kind and so just one kind-specific unity relation. (Schwarz, 2014: 1079)

Nevertheless, it is not clear that the case of Dion and Theon involves multiple unity relations. Theon is not, starkly, a thing of a different kind from Dion in the way that Lumpl is a thing of a different kind from Goliath. Though Theon is not a person prior to Lefty's annihilation, he is a *proto-person*, an individual that has everything it takes to be a person apart from, possibly, being spatially maximal. Every person is a proto-person and overlaps innumerable overlapping proto-people who are not persons. Arguably *person* and *proto-person* are not different, unrelated sortals that determine different unity relations in the way that *lump* and *statue* do but rather *person* is a restriction on *proto-person*. And it is not plausible to suggest that *person* and *proto-person* determine different unity relations. Persons are just proto-persons that are maximal and the same kinds of causal relations that hold on stages of persons, including those that are responsible for psychological connectedness and continuity, hold on stages of proto-persons that are not maximal.

'Proto-person' is not an English sortal but sortals may be contrived, or develop naturally as needed. Schwarz has no objection to making up sortals. Indeed, he suggests that some cases of fission may be treated like the case of Goliath and Lumpl, where different unity relations are involved, if suitable sortals are introduced.

> [T]here is no good reason to think that the supply of sortal nouns in English exhausts the unity relations…When dealing with cases of occasional identity, it seems that we can also introduce new sortals, speaking of the ship-qua-assembly-of-those-planks, or the train-qua-turning-south [where trains divide]. (Schwarz, 2014: 1080)

This poses the question of when different sortals are associated with different unity relations. *Ship-qua-assembly-of-those-planks* and *ship-qua-continuously-repaired* do express different temporal unity relations in the Ship of Theseus scenario, where a continuously repaired ship and ship constructed of cast-off planks according to the original design go their separate ways. The Ship of Theseus is the same *ship-qua-assembly-of-those-parts* as the curio object assembled by the plank-hoarder but not the same *ship-qua-continuously-repaired.* The temporal unity relations associated with *ship-qua-assembly-of-planks* and *ship-qua-continuously-repaired* are different:

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[9] Schwarz argues that 'the fact that there is just one material object…does not undermine the non-identity of Lumpl and Goliath'. (Schwarz, 2014: 1979 footnote)

to satisfy the conditions for the former stages have to consist of the same planks; to satisfy the conditions for the latter they do not. The introduction of the new sortals, *ship-qua-assembly-of-planks* and *ship-qua-continuously-repaired*, has a purpose: it marks a difference in the unity relations that hold on stages of coincident objects.

5.2 Identifying Unity Relations

The introduction of *train-qua-turning-south* and, presumably, *train-qua-turning-north* in addition to just plain *train*, however, seems gratuitous. What *makes* something the same train at different times makes it the same train regardless of the direction in which it is headed. Whether a train is going south or north the conditions for the unity relation *train* holding on successive stages are the same, viz. that it consist of mostly the same carriages hooked up in the appropriate way.

The relation between stages of southbound and northbound trains are not of course the same: the former holds on stages that consist of mostly the same carriages hooked up in the appropriate way *and* are parts of a southbound train while the latter holds on those that consist mostly of the same carriages hooked up in the appropriate way that are parts of a northbound train. We could call these unity relations for trains *qua* turning south and trains *qua* turning north respectively but this would ignore the purpose for which the notion of a 'unity relation' on successive stages was introduced in the first place: to state informative necessary and sufficient conditions for the persistence of ordinary objects in formulating criteria for their 'identity through time'.

It is, always possible multiply unity relations beyond necessity. So, in an account of personal persistence, we might hold that the temporal unity relation for *person-in-Oshkosh* is different from the temporal unity relation for *person-in-Kenosha* since the stages on which these unity relations hold are in Oshkosh and Kenosha respectively. We could cut things even more finely and individuate unity relations by zip code. This, however subverts the motivation for introducing the notion of a unity relation in accounts of how ordinary objects of various kinds persist. The temporal unity relation for ordinary objects of a kind K supervenes upon the intrinsic character of K-stages that exist at different times and the causal and spatiotemporal relations in which they stand that *make* them 'the same K'. Extrinsic circumstances are irrelevant: what *makes* someone the same person from one time to another, the causal and spatio-temporal relations that matter in personal survival holding on stages, is the same regardless of location.

Unity relations mark what it is that *makes* an object of some kind persist. Sortals F and G are associated with different unity relations when what *makes* something the same F is different from what *makes* something the same G. What *makes* something the same *ship-qua-assembly-of-those-planks* is different from what *makes* it the same *ship-qua-continuously-repaired*. But introducing new sortals does not always introduce new unity relations. What *makes* something the same train-qua-turning is the same as what makes it the same train-qua-turning-north namely the conditions that make the unity relation for *train* hold on successive train stages. There is just one unity relation for *train*, which holds on the stages of a train regardless of the direction in which it is headed. The case of the dividing train therefore is more naturally treated

as a 'genuine' case of occasional identity, to which Schwarz's counterpart-theoretic semantics applies. And so it is, arguably, for the case of Dion and Theon.

Before Lefty's annihilation Theon is not a person. But, like Dion in whom he is embedded, Theon is a proto-person and what *makes* something the same *proto-person* over time is what makes something the same *person*—whatever that is, whether the causal relation responsible for psychological connectedness and continuity or something else. The unity relation for *person* is just the unity relation for *proto-person* in the way that the *unity relation for train-qua-turning-south* is just the unity relation for *train*. Before dividing, according to Schwarz's original rendition of the case of dividing trains, there is just one train—not overlapping north- and south-bound trains. So it is with Dion and Theon who after Lefty's annihilation are the same person. There is just one unity relation involved in the case and so it may be treated as a 'genuine' case of occasional identity according to the counterpart-theoretic scheme Schwarz proposes.

6 Dion and Theon: A Counterpart-Theoretic Solution

Using the counterpart-theoretic tools Schwarz develops makes it possible to adopt the intuitively correct reading of the Dion-Theon scenario, understand as a fusion case, without contradiction.

At t_1, before Lefty's annihilation, Theon is not identical to Dion. That is to say, on Schwarz's counterpart-theoretic scheme, there is no counterpart assignment on which 'Dion' and 'Theon' denote the same object at t_1. Hence (1):

(1) At t_1, Dion$\neq$Theon.

There is however a counterpart assignment on which 'Dion' and 'Theon' denote the same object at t_2 namely an individual whom, we shall say, is baptized 'Footless' after Lefty's annihilation. (2) therefore is true as desired:

(2) At t_2, Dion=Theon.

There is just one person around after Lefty's annihilation, namely Footless. Footless *was* Dion before Lefty's annihilation: Dion survived the loss of his left foot as Footless. Arguably, Theon also survived and before Lefty's annihilation Footless *was* Theon. To see this consider the way in which we should view the proceedings from the perspective of t_2 and run the story backward, beginning with Footless. Dion and Theon are each counterparts of Footless at t_1 so at that time each is Footless:

(7) At t_1, Footless=Dion.
(8) At t_1, Footless=Theon.

At t_1, however, 'Dion' and 'Theon' denote Footless on different counterpart assignments so (7) and (8) do not entail (9), which is false:

(9) At t_1, Dion=Theon.

At t_2 however 'Dion' and 'Theon' denote Footless on the same counterpart assignment, so (3) is false too.

(3) At t_2, Dion≠Theon.

(1) and (2) are true but there are no individuals who are at identical at some times but at other times distinct, and no contradiction.

This account comports with our intuitive reading of the Dion-Theon scenario to the extent that we should, without hesitation, affirm (1), (2) and (7). Dion is not identical to Theon before Lefty's annihilation but is identical to Theon afterwards and, clearly, the footless individual at t_2 is the same person as Dion, whom we met at t_1. It is not however clear whether that footless individual is the same person as Theon who, before Lefty's annihilation, is embedded in a person but is not then himself a person. Chrysippus himself held that Theon does not survive the annihilation of his host's left foot and there are, indeed, there are some extraordinary objects that cannot survive detachment or extraction. Holes, notoriously, depend for their existence on their hosts.

Theon however is a robustly material object that is embedded in a larger material object and such things do not cease to exist when extracted. Proto-statues embedded in blocks of marble do not cease to exist when extraneous marble is chipped away. Embedded proto-statues residing in blocks are spatio-temporally continuous with the statues that emerge, constituted of the same stuff, and of exactly the same shape. That is as good as it gets for the persistence of ordinary material objects. Proto-statues *become* statues upon being extracted. While a block is intact, we cannot of course imagine the proto-statue inside or even with the benefit of 3D CAD software delineate its shape. But that's our problem—the sculptor can do better. Embedded hunks of marble do not cease to exist when extracted and statues do not come into being *ex nihilo.* The statue that emerges *is* the hunk that was formerly embedded in the block.

So it is with Theon. The annihilation of Lefty does not destroy Theon any more than sculpting destroys an embedded hunk.[10] Both Dion and Theon survive Lefty's annihilation. (7) and (8) are both true: at t_1, Footless is Dion and Footless is Theon. But Dion is not identical to Theon at t_1 since than Footless=Dion and Footless=Theon on different counterpart assignments. Upon Lefty's annihilation Theon becomes a person. At t_2, Theon is a person and there is a counterpart assignment on which both he and Dion are personal counterparts of Footless so (2) is true. At t_2, Dion=Theon since at t_2 'Theon=Footless' and 'Dion=Footless' are true on the same counterpart assignment.

Schwarz's counterpart-theoretic semantics is an elaborated but detoxified version of stage-theoretical semantics and is he argues, is metaphysically innocent in that it is not committed to the stage theory, the worm theory, or any other controversial metaphysical account of how things persist. If that is correct then whatever we take

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[10] But cf. Moran, 2018 who argues, in the spirit of Chryssipus that Theon is a dependent part of Dion that ceases to exist upon the annihilation of Lefty.

Dion and Theon to be, whether transtemporal worms, instantaneous stages, or enduring objects, they exist both before and after the annihilation of Lefty. There are two overlapping individuals before Lefty's annihilation, whether we take Dion and Theon to be instantaneous stages, perduring aggregates of stages, or enduring objects and there are not on any account two individuals of the same kind exactly occupying the same region at t_2, after Lefty's annihilation. At t_2 there is just one person occupying that region: Dion a.k.a. Theon.

Declarations

Conflict of Interest The author declares that they have no conflict of interest.

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