The Problem of Too Many Mental Tokens Reconsidered

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Abstract: The Problem of Too Many Thinkers is the result, implied by several "permissive" ontologies, that we spatiotemporally overlap with a number of intrinsically person-like entities. The problem, as usually formulated, leaves open a much-neglected question: do we literally share our mental lives, i.e. each of our mental states, with these person-like entities, or do we instead enjoy mental lives that are qualitatively indistinguishable but numerically distinct from theirs? The latter option raises the worry that there is an additional Problem of Too Many Mental Tokens. This paper argues that there is indeed such a problem, at least in fission cases. In the course of articulating this problem, we will make a number of surprising discoveries about the relationship between personal persistence and the metaphysics of mental entities. We will also see that the Problem of Too Many Mental Tokens has significant epistemological and ethical implications, which will haunt us even once we have addressed the Problem of Too Many Thinkers.

Keywords: fission, mental states, perdurantism, persistence, personal identity, too many thinkers, too many thoughts

1. Introduction

The personal identity literature is full of "overpopulation problems". One goes as follows. I'm a thinker; I have a toe; plausibly, then, I also have a "toe-complement", i.e. the mereological difference of me and my toe. This toe-complement has the physical basis for being a thinker; after all, I could lose my toe and continue to be a thinker. But then it's hard to avoid the conclusion that I share my place with a plethora of other thinkers, such as toe-, finger- and skin cell-complements.[1] (Even if you harbor suspicions about such "arbitrary undetached parts", some of my thinking parts aren't arbitrary. You didn't need to know any metaphysics to know that you have a head and a brain.)

[1] For discussions of this problem, see Olson 1995, Merricks 1998, Burke 2003, Sider 2003, Kovacs 2010, 2016, Sutton 2014, and Madden 2016.

The puzzle also has a temporal variant. Suppose you persist by having temporal parts at different times. That is, what it takes for you now to be the same person as your 10-year-old self is for you to be a temporally extended "worm", part of which is a present person-slice currently reading this paper and another part of which is a 10-year-old person-slice that bears the right kind of connection to it. If so, you temporally overlap with millions of other person-like entities. When you think, they think with you.[2]

If there are many thinking beings where we are, metaphysical strangeness isn't our only or even our main problem. There is also an epistemological puzzle: if I share my place with a toe-complement, a finger-complement, and all sorts of temporal parts, how can I know that I am not one of *these* things? After all, they have the exact same evidence for their beliefs about themselves that I do for mine.[3] And it gets worse: for it has recently been argued that overpopulation leads to insurmountable challenges in ethics when it comes to moral responsibility, punishment, investment in one's future, and utility calculation.[4]

This "Problem of Too Many Thinkers" is sometimes mentioned along with an analogous puzzle about *thoughts*: it's not just that there are too many thinkers where one might have thought there was only one, but there are also too many (seemingly indistinguishable) thoughts that they think. This problem is often called the "Too Many Thoughts Problem" [5], but it isn't unique to thoughts; it may well arise for other kinds of mental states, events, and processes (the question

[2] See Lewis 1976, Zimmerman 2003, Olson 2007, and Kovacs 2020.

[3] See Burke 2003, Kovacs 2016, 2020, and Madden 2016. For pushback about how the problem should be exactly formulated, and whether anything remains of it once we are forced formulate it precisely, see Tullio and Soriani 2024.

[4] See Olson 2010, Taylor 2013, and Johnston 2017a, 2017b.

[5] See, e.g., Zimmerman 2003: 497.

which ones will be a major topic of this paper). To emphasize the general nature of the problem, I will henceforth refer to it as the *Problem of Too Many Mental Tokens*.

While the Problem of Too Many Thinkers has a sizeable literature, the Problem of Too Many Mental Tokens received less attention. In Section 2, I will raise a new version of the Problem of Too Many Mental Tokens, which arises in fission cases: the Problem of Splitting Mental Continuants. In Section 3, I will show that the Problem of Splitting Mental Continuants raises a *sui generis* epistemological problem that certain familiar approaches to the Problem of Too Many Thinkers cannot handle. Finally, in Section 4 I will argue that the Problem of Splitting Mental Continuants also blocks certain solutions to ethical problems that were developed primarily with the Problem of Too Many Thinkers in mind. In Section 5 I will briefly consider two attempts at tackling the problem and will then draw some conclusions.

Before continuing, a word of clarification is in order. As we will see in the next section, the Problem of Splitting Continuants is a problem for everyone; yet, throughout the paper I will presuppose perdurantism as my default view of persistence: material objects (including people) are four-dimensional "worms" that persist over time in virtue of having temporal parts at each time when they exist.[6] There are two reasons for this. First, overpopulation problems are most commonly discussed against the background of a perdurantist metaphysic. Second, perdurantism is often thought to provide an especially elegant solution to the familiar fission problem of personal identity. Thus, the fission puzzle I will raise, and which, I will argue, resists analogous treatment, affects everyone but is especially poignant for perdurantists.

[6] Perdurantists include Lewis (1976), Heller (1990) and Hudson (2001).

2. The Problem of Splitting Mental Continuants

Is there a Problem of Too Many Mental Tokens? There is no consensus about this in the literature. Some authors take it for granted that there is such a problem (Zimmerman 2003: 497; cf. Mills 1993). Others have pointed out that the Problem of Too Many Thinkers doesn't automatically saddle us with a Problem of Too Many Mental Tokens (McMahan 2002: 89, Kovacs 2016: 1089–91, Tzinman 2020). The most detailed discussion of the Problem of Too Many Mental Tokens to date is Francescotti 2017. Francescotti argues that there *is* a Problem of Too Many Mental Tokens, and he bases his argument on the individuation of mental states, events and processes ("mental episodes", as he collectively refers to them). His basic idea is that for any entity x and mental property F, there are guaranteed to be some entities or other (be they tropes, events, states of affairs or what you have) that satisfy the description, 'the instantiation of F by x', and in the case of objects with overlapping minds, there will be more than one such entity.

The success or failure of Francescotti's argument crucially depends on whether we can give sufficiently coarse-grained accounts of each of the ontological categories he discusses so that we can reasonably deny that overlapping thinkers instantiate more than one instance of the relevant category. I suspect that the answer is affirmative, which would render Francescotti's argument inconclusive. Unfortunately, I lack the space the adjudicate the issue here. Instead I will offer an entirely different line of reasoning that leads to a version of the Problem of Too Many Mental Tokens, which is based on fission cases and doesn't make any controversial assumption about how fine-grained mental tokens are.

Fission cases are familiar from the personal identity literature.[7] In this section, I will put them to a less familiar task: I will use them to show that there is a Problem of Too Many Mental Tokens, after all. In the course of building up my case, it will also become clear that there are crucial differences between different types of mental tokens: we can formulate the problem in terms of thoughts and beliefs, but arguably not in terms of sensory states. We can formulate an overcrowding problem about mental tokens by amending a regular fission scenario with a little internal monologue, along the following lines.

> *Tom's Soothing Fission Thoughts*. Tom undergoes brain surgery, and his two hemispheres are transplanted into two bodies with an empty skull. After the surgery, two thinking beings have all of Tom's apparent memories and personality: Rightom and Leftom. Tom remains conscious throughout the whole procedure. In order to avoid getting stressed out too much, as a distraction he is focusing on a neutral, soothing thought unrelated to the surgery: *grass is green*. Once the surgery is finished, Rightom and Leftom still keep thinking to themselves, *grass is green*, when they suddenly realize that the surgery is over and that they are two distinct and completely separated thinkers, incredulously staring at each other.

This thought experiment is a variation on the familiar fission problem from the personal identity literature. The problem, as it arises for Tom, is that any verdict on what happens to him (he persists as Rightom, Leftom, both, or neither) has seemingly absurd consequences. He can't persist as both, since Rightom isn't identical to Leftom, and by the transitivity of identity, they would have to be if both are identical to Tom. He can't persist as just one of them, since (we can assume) he bears

[7] Classics include Perry 1972, Lewis 1976, Parfit 1984, and Shoemaker 1984a.

the exact same physical and psychological relations to Rightom and Leftom, and there is no further fact that could break the symmetry between them. And it seems that he also can't persist as neither. For if only Rightom had emerged from the surgery and the left hemisphere of Tom's brain had been destroyed, there would be no question that Tom survived as Rightom, and it's implausible that the mere existence of an additional being suffices to make it the case that Tom doesn't survive the surgery (and *mutatis mutandis* for Leftom). Most theorists of personal identity either (grudgingly) choose this third option or buy into a perdurantist metaphysic that allows a fourth one. Those who do the latter argue that "Tom" is identical to both Rightom and Leftom, but not because Rightom is identical to Leftom. Rather, 'Tom' has been referring to two overlapping persons from the outset, who were indistinguishable from each other until the time of fission. Persons are four-dimensional "worms" that persist over time by having temporal parts at different times, much as they extend in space by having different spatial parts at different spatial regions (Lewis 1976). The names 'Rightom' and 'Leftom' refer to four-dimensional "worms" whose pre-fission temporal parts are identical but whose post-fission temporal parts diverge. Fission is, strictly speaking, the divergence of two persons from each other who used to spatially coincide.

All of this is very familiar. However, henceforth I would like to focus on a less familiar aspect of Tom's Soothing Fission Thoughts: I want to ask what happens not to Tom himself, but to his *thought*, "Grass is green", during and after fission. Since Rightom and Leftom continue thinking this thought after the procedure ends, we can wonder about the identity of Tom's pre-fission thought: is it identical to Rightom's thought, Leftom's thought, both, or neither? On the face of it, possible solutions to the problem of thought fission are identical to those to the problem of personal fission. But I will argue that this is not quite right: in the latter case, the perdurantist solution isn't available because even if material objects can persist by perduring, thoughts can't. Thus, the

Problem of Splitting Mental Continuants is a problem for both endurantists, who think that objects persist by being wholly present at each time of their existence, and for perdurantists, but the only available solutions to it are the endurantism-friendly ones.

The endurantism-friendly solutions face the same problems as their analogues in the case of personal fission. Judging that Tom's thought persists as either Rightom's or Leftom's thought seems objectionably arbitrary. Judging that it persists as both would violate the transitivity of identity, since the two thoughts clearly aren't identical to each other. And judging that it persists as neither is also a highly unattractive option, since we can stipulate that nothing disrupts Tom's thinking throughout the fission process. Surely, as long as nothing stops the thinking of a thought, that thought continues to exist.

Later, we will revisit these options. But first, let's consider what's wrong with applying the perdurantist treatment of fission to Tom's thought. The perdurantist option is to say that both Rightom's and Leftom's token thought existed before fission, and they merely came apart from each other. Before fission, Rightom and Leftom think two temporally overlapping token thoughts, both with the content "Grass is green". Surely, one could argue, this diagnosis is preferable to the most tolerable endurantism-friendly view, according to which Tom's thought instantaneously gets replaced with two similar but numerically distinct token thoughts, despite no apparent cognitive disruption throughout the fission process.

Unfortunately, there is a complication with this straightforward treatment of splitting thoughts: a strong case can be made that perdurantism isn't a promising account of the persistence of *thoughts* over time. Here, I'm relying on a famous observation of Peter Geach (1957: 103–6; 1969: 34–7) about the temporal character of thinking, which he makes in the context of his criticism of William James' reference to a "stream of thought". We may well experience our sensory states

like a stream; for example, a pain can be continuous or intermittent (Geach 1969: 36) and can increase and decrease in intensity. For example, the pleasure derived from spicy food can gradually turn into a mixture of saturation and numbness, and eventually unpleasantness, once it becomes too much of a good thing. Thinking, by contrast, isn't stream-like at all. For example, thoughts cannot gradually transition into each other.[8] If I think a thought and then another thought, the first thought needs to stop completely before the second begins.[9]

Geach thought there was no stream of thoughts because thoughts are individuated by their propositional content, and we grasp these contents "all at once" rather than bit-by-bit over time. If it seems otherwise at first glance, this is because when we utter the *sentence* "Grass is green", we first utter 'grass', then 'is', and then 'green'. But the temporal character of utterances doesn't reflect the temporal character of the thoughts they express. When we think "Grass is green" for a certain period of time, we think the entire thought "all at once", not first its "first half" and then its "second half".[10]

It's worth making it more precise why Geach's insight about the temporal character of thinking supports the conclusion that thoughts don't perdure. The claim that thoughts have propositional contents and are individuated by them doesn't by itself have this consequence. As I understand Geach's argument, there is an unstated additional premise: no mental entity is a good candidate

[8] Geach varyingly speaks of "thoughts" and "thinking". I prefer to phrase my point in terms of thoughts, because I suspect that mental states are more familiar to theorists of personal identity. I will have more to say about mental processes below.

[9] Cf. Soteriou 2013: 33.

[10] Geach attributes a similar view to Aquinas (Anscombe and Geach 1961: 96). For further discussion, see also Mouton 1969 and Soteriou 2013: 33–34.

for serving as the temporal part of a thought with propositional content. While I cannot exhaustively cover logical space here, I think we can readily dismiss the candidates that most naturally come to mind.

First, it seems clear that the temporal parts of a thought cannot be shorter-lived versions of the same thought. That would imply that if I think "Grass is green" for a certain period, no matter how short, then I think a thought with this content *many times over*. This doesn't do justice to the appearances; it doesn't seem to me that when I stop to think about the color of the grass for a few seconds, I entertain plenty of thoughts with the same content. The point isn't just that perdurantism about thoughts is unintuitive (a charge that has also been marshalled against perdurantism about material objects in early stages of the literature[11], but which is today considered inconclusive), but that in the case of simple thoughts like "Grass is green", there is no daylight between the phenomenology and reality: I can tell, by reflection, how many thoughts I've had for a certain very short period.

Here's a further consideration against the perdurance of thoughts. Duncan (2015) argues, on the basis of phenomenology and neuroscience, that thinking a thought always takes time, i.e. thoughts have a minimal duration. If so, then at least not *every* thought can have shorter thoughts as temporal parts, since some of these sub-thoughts would have to be under the threshold of minimal duration. But then, in order to block a perdurantist-friendly resolution of the puzzle, we can just stipulate that the thought in Tom's Soothing Fission Thought was exactly at the threshold of minimal duration. For this to be possible, fission needs to take place after Tom's thought began to exist but before the thought ceased to exist. Duncan's insight doesn't rule out this scenario, since even if thoughts have a minimal duration, it doesn't follow that other types of events (such as

[11] Thomson 1983.

fission) have, too. Thus, we can stipulate a case in which fission takes place instantaneously, while Tom's minimal-duration-long thought begins slightly before it and ends slightly after it. In such a case, we cannot explain the persistence of Tom's thought by temporal parts that are themselves shorter-lived thoughts.

A second option is that the temporal parts of a thought aren't shorter-lived thoughts, but mental entities that correspond to the concepts that make up the thought's propositional content. But this approach looks even less promising, for the reasons already mentioned by Geach: when I think "Grass is green", I don't *first* think 'grass' and *then* 'green'. (Consider this: some languages, for example Filipino and Gaelic, have verb-subject-object rather than English's subject-verb-object order. But the suggestion that Filipino and English speakers somehow think "Grass is green" in a different order seems very implausible.)

A third possibility is that thoughts have temporal parts, but these temporal parts have neither propositional nor sub-propositional structure. They are different things altogether. They are mental entities, but not much can be said about them other than that they are the temporal parts of thoughts. Although I cannot conclusively refute this view, I think we should reject it on the basis that it says almost nothing. While we cannot rule out in advance views that posit new and strange mental entities, I see little reason to posit such things in the absence of *some* positive characterization of them.

It's reasonable to conclude that thoughts don't persist by perduring. What's the upshot for perdurantism itself? According to an ambitious interpretation of perdurantism, it is a theory of persistence that applies to absolutely anything that can be said to persist over time. Geach's insight and the possibility of thought fission are incompatible with perdurantism in this very strong sense. However, I think that perdurantism is more reasonably understood as an account of the persistence

of material objects only (cf. Donnelly 2011: 28 n2). On the face of it, perdurantism is consistent with endurantist accounts of types of persisting entities other than material objects; indeed, some authors have explicitly endorsed such a combination of views. For example, Armstrong was a perdurantist about material objects (1997: 104–7) but thought that universals were identical between their instances, wholly located where each of their instances were (1997: 27, 33, 97–98), while Ehring defends a perdurantist account of persistence that is not merely compatible with but *based on* causal relations between enduring tropes (2011: 50–68).

So far I have left open the ontological category to which thoughts belong; it's common to describe them as states, but we can plausibly think of them as tropes as well (or perhaps assimilate states into tropes). Later on, I will have more to say about the types of entities for which puzzles of this sort arise. For now, suffice it to say that perdurantism about material objects isn't *per se* incompatible with endurantism about entities other than material objects. Depending on the type of enduring entity, such a combination of views is even independently unmotivated (see Ehring's systematic account of perdurance, which presupposes an endurantist account of trope persistence). However, Geach's insight suggests that the impossibility of perduring thoughts does make the perdurantist account of personal fission less attractive. For one thing that we might have hoped to get out of such an account is that we could thereby avoid the trilemma of unattractive endurantist solutions to the puzzle, and it seems that the impossibility of thought perdurance forces us to adopt one of those solutions about thoughts.[12]

[12] Above I argued that thoughts couldn't perdure in the sense usually meant by perdurantists, which assumes the existence of temporal parts. But can they perhaps extend in time without having temporal parts? Parsons (2000) defended a hybrid (four-dimensionalist but non-perdurantist) account of persistence, according to which material objects are extended in time but lack mereological structure; they are the temporal analogues of extended simples.

Suppose, then, that we accept the Geach-inspired argument I outlined above, accept that a thought cannot cease to exist unless it's disrupted, and also rule out the possibility that Tom's thought is identical to either Leftom's or Rightom's thought (even though nothing breaks the symmetry between them). Then our best bet is to say that if Tom undergoes fission while thinking a thought, then two numerically distinct token thoughts existed right at the outset, which overlap spatiotemporally but not mereologically: before fission they are realized by the same brain state at the same time, but they don't share any part. If this is right, then there is a Problem of Too Many Mental Tokens, at least in fission cases that involve uninterrupted thinking throughout the fission process. Since perdurantism about thoughts is unavailable to both the perdurantist and the endurantist, and the endurantism-friendly alternatives (Tom's thought persists as neither

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Could thoughts be like that? Most of the considerations I offered against thought perdurance don't extend to a Parsons-style unorthodox four-dimensionalism about thoughts. However, such a view doesn't help with the problem of what happens to a thought during fission. The main attraction of an orthodox perdurantist account of thought fission (if it were available) is that it avoids the conclusion that there is too much mentality in the same place at the same time. If thoughts and other mental continuants shared pre-fission temporal parts, there wouldn't be an epistemological problem about which of two overlapping fission offshoot a certain thought belongs to: as long as the present thought-part is a temporal part of two thoughts, any attempted reference to it would refer indeterminately to both thoughts of which it is a temporal part, and indeterminacy is epistemologically much less concerning than ineffability (see section 3). There wouldn't be an ethical problem either: for as long as temporally extended value-bearing mental states, for example desires, share their pre-fission temporal parts, we wouldn't have to double-count the satisfaction of two overlapping people's overlapping desires (pre-fission, the satisfaction of both desires is valuable, but they share the same value instance – see section 4). But these elegant answers presuppose the existence of temporal parts; if there are no temporal parts, then spatiotemporally overlapping thoughts *do* raise an epistemological problem before the time of fission, and the value of the satisfaction of spatiotemporally overlapping desires *should* be double-counted. Thus, even if thoughts could persist in line with Parsons' theory, this wouldn't help with the problems I'm going to discuss below.

Rightom's nor Leftom's thought, or as both, or as exactly one) are equally unattractive to the perdurantist and to the endurantist, this seems to be our only remaining option: there have been two overlapping thoughts already at the outset, and they just came apart.

Let me consider a few objections to this argument. One possible objection is that the thought experiment is under-described. For Tom's pre-fission thought is realized by some particular brain structure or other. If the brain structure is present in only one hemisphere, then Tom's thought persists in whichever offshoot inherits that hemisphere; and then it was wrong to stipulate that no difference between Rightom and Leftom breaks the symmetry. And if the brain structure is present in both hemispheres, the result of thought duplication isn't so problematic after all. If two redundant brain structures realize the thought "Grass is green", why not simply accept that the same subject has two qualitatively indistinguishable thoughts? However, this objection proves too much. Virtually all realizers of our mental states include a certain amount of redundancy; if brain structure b can realize a mental state, so can the mereological difference of b and some electron (b-). But we wouldn't on that account infer that b and b- realize two distinct qualitatively indistinguishable thoughts, or even worse, that there are as many qualitatively indistinguishable thoughts for any content as the number of overlapping brain structures that are intrinsically sufficient to realize them. We should say something similar about fission cases. The proper way to think about Tom's Soothing Fission Thoughts is that Tom's pre-fission thought was realized by a brain structure, and that both Leftom and Rightom inherited enough of that brain structure to continue having the thought in question. This redundancy doesn't imply that the sub-structures that went to Leftom and Rightom realized two qualitatively indistinguishable mental states already before fission.

A second objection is that the mere metaphysical bizarreness of overlapping thoughts is tolerable insofar as it isn't accompanied by epistemological puzzles. Thinking while splitting is a fairly peculiar scenario. As long as the puzzles it raises don't generalize to mental states that don't occur shortly before fission, we shouldn't be too bothered by it.

However, manifest thoughts aren't the only mental tokens that don't persist by having temporal parts. Beliefs are also susceptible to the Geach-inspired argument: they have a temporal structure similar to that of thoughts, and nothing seems like a plausible candidate to count as the instantaneous temporal part of a belief (neither short-lived beliefs with the same content, nor beliefs with a different content, nor words of Mentalese). However, beliefs differ from thoughts in that we don't need to actively entertain them in order to have them. What this means is that beliefs tend to be more durable then thoughts.[13] More worryingly, many of our beliefs are *de se*, and there's no reason why a *de se* token belief couldn't survive fission. In fission cases *de se* beliefs saddle the perdurantist not only with metaphysical but also with epistemological quandaries. Take the following case.

> *Tamar's craniotomy*. Sometime in the distant future, Tamar has brain cancer. The conventional treatment is to subject her to a fission procedure that will result in Rightamar, who will be completely cancer-free and is expected to live at least for another 30 years, and Leftamar, who will inherit the cancerous half of Tamar's brain and die within 3 months after the surgery. Before the operation, Tamar is optimistic that she will get to see her children grow up. Shortly after the operation, both Leftamar and Rightamar wake up optimistically; they

[13] See O'Shaughnessy 2000: 43 for states of knowledge as enduring entities. I take it that these states are special cases of belief.

both still believe that they will see Tamar's children grow up. Leftamar only learns of the bad news that she is the offshoot who inherited the cancerous half of Tamar's brain a few hours later, after which she stops believing that she will see her children grow up.

As in the case of *Tom's Soothing Fission Thoughts*, the best thing that a perdurantist can say here is that Rightamar and Leftamar had qualitatively similar but numerically distinct token beliefs already before fission. Moreover, since beliefs don't persist by perduring, these beliefs don't share any temporal part and are both wholly present as long as Rightamar and Leftamar hold them.

The problem is now apparent. A token belief that is determinately Rightamar's after fission as well as a token belief that is determinately Leftamar's after fission, exists already before fission. Thus, when Rightamar believes, "I will get to see my children grow up", there is room for her to wonder *who* the subject of this belief is. Of course, Rightamar knows who the subject is under a first-person guise ("it's me!"). However, she is liable to err about *which entity* is the subject of her present thought. Her epistemic situation is significantly worse than it is taken to be by most perdurantists. For example, according to the orthodox Lewisian version of the view (Lewis 1986), which four-dimensional worm Rightamar refers to when she thinks 'I' is indeterminate rather than unknowable; while according to my Self-making View (Kovacs 2016, 2020), the reference of Rightamar's use of 'I' is settled by which four-dimensional worm is the best non-accidental satisfier of 'I' as used by the various overlapping things in Rightamar's vicinity. As I will show in the next section, these views presuppose the sharing of numerically the same token mental state by different thinkers. Once we drop this assumption, a substantive question emerges about *who is thinking this very thought*, to which no amount of information equips Rightamar and Leftamar to know the answer.

I stated the problem in terms of manifest thoughts and standing beliefs, but any mental token that persists not by having temporal parts – any *mental continuant,* as I will refer to such things – would fit the bill. To cite another example, think of mental processes. Some philosophers distinguish between events and processes, whereby processes enfold (as opposed to events, which occur). The difference may be illuminated by noting that processes can *undergo* changes, whereas events *are* changes. For example, if Bob runs five miles, the process that is *his running* may be energetic first and tired and slow later on; but at each time it's numerically the same process that keeps changing its features. By contrast, the event that is *his run* has an initial energetic and a later tired temporal part.[14] If processes cannot persist by perduring, then mental processes are another example of mental entities that cannot be shared by overlapping people if they are to persist through fission. For instance, if both Leftamar and Rightamar are in the process of wondering whether they will see their children grow up, then already before fission Leftamar's wondering must be distinct from Rightamar's wondering.

Let me sum up what we have learned so far. Geach's insight teaches us that thoughts aren't stream-like. More generally, some mental entities don't persist in virtue of having temporal parts; thoughts, beliefs and mental processes are among the good candidates for being such entities. These mental entities raise a distinctive version of the Problem of Too Many Mental Tokens: if they persist through fission, they must have been distinct already before fission; but since they cannot perdure, they don't have pre-fission temporal parts that they could share. Thus, there were several duplicate mental tokens where we might have thought there was only one. Call this the *Problem of Splitting Mental Continuants*.

[14] Philosophers who hold that processes lack temporal parts include Stout (1997) and Crowther (2016). For criticism, see Steward 2015.

By now it should be clear that the exact *type* of mental entity in terms of which we formulate the problem is of crucial importance. The problem arises only with certain kinds of mental entities. Which ones? I cannot give a general answer to this question. Some mental entities cannot perdure because they have a content, and that content makes it difficult to see what could count as temporal parts of the relevant mental entity; thoughts and beliefs belong to this group. Other mental entities cannot perdure because they belong to an ontological category no member of which can perdure; processes are a case in point. However, for all I know many other types of mental entities persist by perduring: plausibly sensory states, and perhaps also mental events, such as choices (as opposed to processes, like choosings). In the next two sections, I will take a closer look at the broader significance of the Problem of Splitting Mental Continuants.

3. The significance of splitting mental continuants: epistemology

The Problem of Splitting Mental Continuants is especially poignant for perdurantists, who seek to solve the problem of fission by positing multiple overlapping thinkers. Take, for instance, my own Self-Making View (Kovacs 2016, 2020), according to which each one of a host of overlapping candidates refers to the entity that best satisfies their shared *de se* beliefs.[15] This entity is usually (although not always) the skin-and-membrane-bounded being that comes into existence around the time of birth and goes out of existence around the time of death. The answer to the epistemological aspect of the problem is that I know which candidate I am because I can easily know which candidate fits my 'I'-beliefs best; I just need to reflect on those beliefs. Importantly, on this view

[15] Authors who defend similar views include Johnston (1989), Braddon-Mitchell and West (2001), Braddon-Mitchell and Miller (2004), Miller (2013), and Zimmerman (2013). For a recent criticism of such views, see Longenecker 2022.

all of the thinkers that overlap me share *numerically the same thoughts* as myself.[16] If I and them share numerically the same mental states whenever we think 'I', then once it's settled which four-dimensional "worm" an 'I'-thought refers to, there is no further fact to be known with respect to which I could remain in the dark.[17]

In fission cases, I have suggested that one survives as the offshoot that makes more of one's future-oriented *de se* beliefs non-accidentally true (Kovacs 2020). For example, in *Tamar's Craniotomy* Tamar persists as Rightamar because Rightamar makes the pre-fission belief that Tamar would see her children grow up "non-accidentally true" (in the sense that the belief isn't based on misleading empirical evidence or inappropriate response to empirical evidence). But if Tamar instead believed that she wouldn't see her children grow up, that belief would be true as well, for in that case it would be a belief about Leftamar. Either way, Rightamar's pre-fission beliefs are numerically identical to Leftamar's pre-fission beliefs, and they concern the same four-dimensional worm. Since the future-oriented beliefs themselves determine Rightamar as the intended referent, Tamar's belief that she will see her children grow up is an easy epistemic achievement. However, this solution is in trouble once we drop the assumption that Rightamar and Leftamar hold numerically identical pre-fission beliefs. Suppose Rightamar believes that she will see her children grow up. Given what the Self-Making View says about the reference of 'I', this belief should come out true. If Leftamar's belief were numerically identical to Rightamar's, this would guarantee that this belief is true as well. But the Problem of Splitting Mental Continuants teaches us that this is not the case: Leftamar's belief is an exact *duplicate* of Rightamar's, but not

[16] Thus, the view presupposes what Noonan (1998) calls Personal Pronoun Revisionism: not every thinker uses 'I' to refer to itself; some use it to refer to thinkers with which they overlap.

[17] Cf. Noonan 2001: 328.

numerically identical to it. On the face of it, it is also false; for it isn't a belief about Rightamar but a belief about Leftamar, and Leftamar won't see her children grow up.

The orthodox perdurantist treatment of fission faces the same problem. Lewis (1976) holds that when a person-stage is a part of more than one person (i.e., maximal fusion of psychologically appropriately connected person-stages), as in fission cases, the person-stage's use of 'I' is indeterminate between the two four-dimensional persons. Then Tamar's use of 'I' before fission is indeterminate between Rightamar and Leftamar. Lewis's preferred supervaluationist treatment of indeterminacy recommends that we treat Tamar's belief that she will see her children grow up as true, since there is an admissible precisification of 'I' under which it *is* true. But if Rightamar and Leftamar have numerically distinct beliefs already before fission, this cannot be right. For then, intuitively, Rightamar's token 'I'-beliefs are determinately about Rightamar, and Leftamar's are determinately about Leftamar; since these are two distinct sets of token states, there is little motivation to posit referential indeterminacy. But then, Rightamar has no grounds to assume that her belief that she will see her children grow up is true. After all, Leftamar has a numerically distinct belief with the same content, held on the basis of the same evidence, and that belief is false. Thus, the Problem of Splitting Mental Continuants isn't unique to the Self-Making View and similar conventionalist views; the potential source of skepticism that it introduces affects the orthodox perdurantist framework as well.[18]

The problem (for both orthodox perdurantism and the Self-Making View) is twofold. For one, it's not just that before the surgery, Rightamar and Leftamar lack knowledge of what will happen

[18] Almost all perdurantists assume that overlapping persons share numerically the same mental state before they undergo fission. A notable exception is Mills (1993), although unlike me he doesn't treat sensory states and propositional attitudes differently.

to them. Rather, they lack knowledge of what will happen to them *because* they lack knowledge of who they are. Rightamar overlaps with another object, there is a determinate fact of the matter about which perduring object she is, yet she has no way of knowing this determinate fact. I take it that determinate but in principle unknowable facts about who one is would be a highly undesirable consequence of perdurantism. But there is also a second, related problem. A shared feature of Lewis-style orthodox perdurantism and the Self-Making View is that they deny that there are what Parfit (1984) calls "deep further facts" about personal identity: once all the facts describable in broadly physical or psychological language are in, we know everything there is to be known about personal identity. Both orthodox perdurantism and the Self-Making View respect this intuition: if you're in Tamar's position, then according to the former you *will* see your children grow up because there is at least one admissible candidate referent of your use of 'I' that will see your children grow up; while according to the latter, whether you will see your children grow up ultimately depends on how you choose to use the first-person pronoun. Either way, there isn't a determinate fact of the matter that you're in principle barred from knowing. However, the Problem of Splitting Mental Continuants forces exactly facts of this kind on the perdurantist: if you are in Tamar's position, then there is a fact of the matter about whether you will see your children grow up, but you aren't in a position to find it out.[19] Substance dualists are on record for endorsing such an account of fission (Swinburne 1984), but a purportedly materialist metaphysic of persons with the same feature is mysterious and intellectually unsatisfying. Thus, the Problem of Splitting Continuants is a serious problem for both versions of perdurantism.

[19] Mills (1993) maintains that there is a determinate "further fact" about which (prior to fission qualitatively indistinguishable) stream of consciousness belongs to which perduring person. However, he doesn't address the epistemological problem of knowing which person one's own self-referential mental states refer to.

The Problem of Splitting Mental Continuants is equally a problem for endurantists. Endurantists *agree* that mental continuants don't perdure; it's just that according to them, material objects don't perdure either. Above I focused on perdurantism because for the perdurantist, the impossibility of thought perdurance is disappointing and surprising; for the endurantist it is unsurprising but nonetheless true. Any reason for the perdurantist to accept that none of the three answers to what happens to a thought when it undergoes fission (it persists as both offshoots, or neither, or exactly one) is acceptable, is an equally good reason for the endurantist to agree that none of them is acceptable; thus, the endurantist's remaining option is also to interpret thought fission as involving the separation of spatiotemporally but not mereologically overlapping mental continuants. There are also non-standard versions of endurantism that mimic perdurantism in order to allow for "multiple occupancy" accounts of fission; for example, endurantists can argue that persons are constituted by enduring mereological fusions (by a different one at each moment), and fission involves the coming apart of one enduring constituted non-fusion from another (Miller 2006a, Inman 2014). But these views, whether they are made to mimic Lewis's orthodox perdurantism or my Self-making View (in Kovacs 2016 and 2020, I already formulate the view as compatible with such plenitudinious versions of endurantism) will suffer from the same problems as their perdurantist counterparts.

Does stage theory deal with the problem any better?[20] I don't think so, although stage theory doesn't simply inherit the complications discussed above; rather, it raises a new set of problems of its own. According to stage theory, proper names and pronouns refer to momentary stages, not to the four-dimensional "worms" that they compose, and persistence over time is to be analyzed

[20] For stage theory, see Hawley 2001 and Sider 2001; for specific applications to personal identity, see Sider 2018 and Kaiserman 2019.

in terms of temporal counterpart relations, rather than belonging to the same four-dimensional object. So, Tamar's pre-fission belief that she will see her children grow up is true just in case she bears the right kind of temporal counterpart relations to some post-fission instantaneous objects that see her children grow up. Some kind of psychological continuity is often taken to be important for the relevant temporal counterpart relations, but the Problem of Splitting Mental Continuants suggests that this cannot be the whole story. For take an instantaneous pre-fission stage at t1, Tamar1. At a certain time after fission, t2, we have instantaneous stages Rightamar2 and Leftamar2, both with the belief, "I will see my children grow up". The switch from perdurantism to stage theory doesn't affect Geach's argument: there should still be two numerically distinct token beliefs, one first had by Tamar1 and then by Rightamar2, and another first had by Tamar1 and then by Leftamar2.

This immediately brings out the first oddity. Note that according to stage theory, people *are* instantaneous stages; mental states should be ascribed to them rather than to fusions thereof. Thus, stage theory combined with enduring beliefs implies that one and the same instantaneous stage has the same belief "twice over", i.e. two qualitatively indistinguishable but numerically distinct beliefs. I'm not persuaded that this idea is even coherent, but I will let it pass. Here's a second puzzling feature of the resulting view. Suppose Tamar1 has a belief with the content "I will see my children grow up". The token of 'I' that appears in the belief picks out an instantaneous stage to which Tamar1 bears the right kind of temporal counterpart relation. Whether this instantaneous stage is Rightamar2 or Leftamar2 should be sensitive to whether the token belief in question is the token belief that persists in Rightamar2 or the token belief that persists in Leftamar2. But given endurantism about token beliefs, Tamar1 has *two* qualitatively indistinguishable beliefs with this content, one that persists in Rightamar2 one that persists in Leftamar2. Moreover, no amount of

introspection will reveal to her *which* token belief she is reflecting on at a certain time. Indeed, the very question has an air of ineffability from Tamar's point of view.

Perhaps the right thing to say here is that Tamar1 is unable to refer to either of her two indistinguishable token beliefs. Whenever she tries to reflect on either belief with the content, "I will see my children grow up", the reference in her act of reflecting continues to be indeterminate between the two beliefs, and there is nothing she can do to eliminate the indeterminacy. I find this hard to believe. Even if we can be ignorant or mistaken about our own beliefs, it is implausible to the extreme that some of them (and beliefs about ourselves to boot) are in this way ineffable to us.[21] Perhaps such ineffability is preferable to skepticism, but it's still a significant bullet to bite for stage theorists.

The main upshot of this section is that the Problem of Splitting Mental Continuants raises serious epistemological puzzles for views that seek to avoid the skeptical implications of the Problem of Too Many Thinkers by arguing that overlapping thinkers can share numerically the same thoughts. Such cases pose a challenge to perdurantist views that tie the reference of 'I' to the speaker's (thinker's) intentions, but orthodox perdurantists, stage theorists, and of course endurantists, aren't off the hook, either.

4. The significance of splitting mental continuants: ethics

Briggs and Nolan's (2015) have recently raised an ethical puzzle about fission. As it turns out, the Problem of Splitting Mental Continuants makes this puzzle potentially more concerning than it would be otherwise. Briggs and Nolan's main target is the combination of consequentialism and

[21] It could be argued that such ineffability would be a case of objectionable "self-blindness", a case in which having a mental state comes apart from the capacity to know that one is in that state (Shoemaker 1994).

the "multiple occupancy" view, according to which there are several overlapping people already before fission takes place (perdurantism is the most familiar, but as noted both by Briggs and Nolan [2015: 294] and by myself in the previous section not the only, version of multiple occupancy). The gist of their problem is that if a person undergoes fission, then any increase in utility that the person acquires pre-fission is an addition to *each* offshoot's level of utility. Suppose, for example, that we need to distribute a cake between five people, one of which will undergo fission seven times (eventually splitting into 128 offshoots). Most versions of consequentialism will recommend giving the entire cake to the splitting person, since the marginal utility that the 128 people will derive from getting all of the cake will outweigh the marginal utility that the four non-splitting people would derive from it.[22]

Briggs and Nolan go through several versions of the puzzle, both for totalizing and for averaging versions of consequentialism. Throughout most of the paper, they presuppose a version of consequentialism that treats persons as the ultimate value-bearers; accordingly, they work with the following principle:

> *Count the Happy People*: The aggregate of wellbeing in the world is given by taking the welfare of each person, and aggregating those levels of welfare. (Briggs and Nolan 2015: 396)

Count the Happy People is a strong principle because it tells us to double-count a utile enjoyed by a person who is going to split even if there is just one mental state that bears that utile for both

[22] There is a close analogy with Johnston's (2017a) puzzles of personites, especially those concerning utility calculation. For solutions to this problem that presuppose mental token-sharing, see Zimmerman 2019, Kovacs 2022, and Montminy and Russo 2024.

offshoots (for example, a pleasurable experience). One possible solution that Briggs and Nolan suggest in order to avoid the problem is to switch to an aggregation principle that treats person-stages rather than persons as the basic utility bearers. In order to avoid puzzles about infinite cases, they recommend introducing a measure on person-stages rather than counting them, and put forth the following principle:

> *Measure the Happy Person-Stages*: The aggregate of wellbeing in the world is given by taking the welfare of each person-stage, and aggregating those levels of welfare. (Briggs and Nolan 2015: 403)

Briggs and Nolan aren't entirely happy with this solution, for as they note, it cannot handle the kinds of asymmetry problems raised by Slote (1982) and Velleman (1991): intuitively, we think that the life of a person who grows up in utter misery, gradually gets out of it and dies happily at old age is *better* than the life of a person whose life follows the opposite trajectory, even if their respective person-stages collectively realize the same level of utility. Briggs and Nolan consider a number of responses to this objection, each with its own intuitive and theoretical costs.

However, there may be an even more fundamental problem with *Measure the Happy Person-Stages*: the principle implicitly assumes that when two overlapping people are happy at some time before fission, they realize the same instance of happiness. The problem with *Count the Happy People* was that we had to count each instance of happiness as many times as the number of people it belonged to. The idea behind *Measure the Happy Person-Stages* is that if we assign happiness to person-stages rather than to people, we don't need to over-count (or over-measure) it in this way. However, in light of the Problem of Splitting Mental Continuants, we can no longer take this

assumption for granted. We cannot rule out that when a person who will undergo fission is happy, she is happy "twice over", so to speak.

Whether one and the same person-stage can be happy "twice over" depends on what happiness is. Briggs and Nolan formulate their puzzle without assuming any particular theory of well-being (wisely so, given their goals). But one interesting upshot of the previous section is that the problem of splitting utility monsters is more poignant for some theories of well-being than for others. To see this, suppose first a hedonic version of utilitarianism: to maximize happiness is to maximize pleasure (and minimize pain). Now, pleasures and pains are sensory states, and as such they aren't affected by Geach's argument; they may well persist by perduring. Suppose, for instance, that Rightom and Leftom are experiencing some pleasure that starts one hour before fission and ends one second after fission. (Briggs and Nolan don't make any assumption about marginal utility increase after fission, but I need this assumption to make my present case. The pleasure's post-fission temporal extent can be arbitrarily short as long as it's non-zero). Unlike in the case of belief, it makes perfect sense to think that pleasures are made up of instantaneous temporal parts (which are also pleasures themselves). The same goes for pain: if I have a throbbing headache, it's perfectly plausible that I first feel one throb, then temporary relief, then another throb, and so on. This means that sensory states don't raise the Problem of Splitting Mental Continuants: they can split by being four-dimensional entities with numerically identical pre-fission temporal parts, just like the subjects that have them.[23] So, in fission cases consequentialism might force us to over-

[23] This is the metaphysics of experience that Dainton (2008: 376) considers the default view conditional on a perdurantist treatment of fission. However, as Dainton points out, the view that experiences have temporal parts isn't entirely uncontroversial, and the view that entire streams of consciousness are atomic has been defended by Carnap,

count pleasure-sensing persons, but not the pleasures themselves.[24] Thus, even if a splitting person's pleasure splits during the process, this doesn't saddle us with multiple qualitatively indistinguishable pleasures in the same place at the same time, and Measure the Person-Stages solves the problem of splitting utility monsters.

Suppose, by contrast, that a desire satisfaction theory of well-being is correct. Then maximizing happiness amounts to maximizing desire satisfaction. In that case, the Problem of Splitting Mental Continuants *does* make Briggs and Nolan's puzzle more serious. Desires, unlike pains and pleasures, are contentful mental states, thus Geach's argument applies to them. Suppose I desire (and simultaneously eat) a fresh pie starting two hours before fission, and finish desiring and eating it one second after fission. While desiring a fresh pie, I don't first desire the pie and then the freshness; I just desire the fresh pie. And when I continue to desire the pie, I don't do so by having instantaneous mental states ("sub-desires"); I just continue to have the same desire, which is "wholly present" in me as long as I (and then for a very short amount of time my fission offshoots) have it. This means that while there isn't a problem of too many pleasures, there *is* a problem of too many desires: if you give a cake to a person who is going to split (as opposed to another who won't), then if his desire persists for an arbitrarily short amount of time after fission, you aren't merely satisfying the desires of more people but are also satisfying *more desires*. Neither counting the satisfied persons nor measuring the satisfied person-stages solves this problem, since in either

among others (Dainton 2000: 90–95). Tye defends a more moderate version of this view: experiences have temporal parts, but those parts aren't themselves experiences (2003: 99). For further discussion, see Javier-Castellanos 2023.

[24] While perduring sensory states don't raise the Problem of Splitting Mental Continuants, they might raise other issues. For example, Chisholm (1971) and Smith (2010) argue that perdurantists cannot explain how diachronically nonuniform experiences can have temporal parts. Lack of space prevents me from discussing this argument here.

case the same person-stage might host several qualitatively indistinguishable but numerically distinct desires.[25]

It seems, then, that the Problem of Too Many Mental Tokens has the potential to undermine a certain group of solutions to Briggs and Nolan's problem of splitting utility monsters – namely solutions that tacitly presuppose that splitting people share numerically identical mental states before fission. As we have seen, whether such approaches are indeed undermined is surprisingly sensitive to the account of well-being that accompanies them: desire satisfaction theorists are saddled with the problem because desires don't perdure, whereas hedonists are off the hook because pleasure and pain are sensory states that can persist by perduring.

5. Concluding remarks: the problem's significance and the prospects solving it

In this paper, I asked whether there was a Problem of Too Many Mental Tokens over and above the much-discussed Problem of Too Many Thinkers. I have argued that fission cases indeed introduce a version of the problem: the Problem of Splitting Mental Continuants. The problem arises for any kind of mental entity that can persist through fission but whose temporal profile resists characterization in perdurantist terms: manifest contentful states (like thoughts), beliefs, desires, and mental processes are among the plausible candidates.

[25] Further complications arise with attitudinal theories of pleasure, which attempt to reduce pleasure to desire satisfaction. Whether these views are affected by the Problem of Splitting Mental Continuants depends on their exact formulation: views that identify *pleasures themselves* with satisfied desires are more vulnerable to the problem than views that analyze the *property of being a pleasure* in attitudinal terms (see Feldman 1997, Heathwood 2007: 29, and Ventham 2021).

The Problem of Splitting Mental Continuants has significant epistemological and ethical ramifications. First, it raises a new source of skepticism about self-knowledge, especially but not only for views that were designed to help us get rid of such problems: not only for the Self-Making View and other kinds of conventionalism, but also for Lewisian and stage-theoretic treatments of future-oriented *de se* beliefs. Second, it aggravates Briggs and Nolan's problem of splitting utility monsters by showing that due to certain metaphysical features of desires (as opposed to pleasures), the most plausible solution to this problem needs to presuppose hedonism.

My primary purpose in this paper was merely to raise the Problem of Splitting Mental Continuants; I didn't make any suggestion about how to solve it. I can think of two ways of going forward, neither of which strikes me as optimal. One possible response to the Problem of Splitting Mental Continuants is that the mental entities that give rise to this problem don't exist. People of course think, believe and deliberate, but strictly speaking there are no such things as thoughts, beliefs, and processes of thinking and deliberating.[26]

This is certainly a possible view, but it needs to be worked out in detail and defended to be a viable response to the problem. Many live debates in the philosophy of mind are conducted on the assumption that the entities that give rise to the problem exist. Moreover, the variety of mental entities that raise the Problem of Splitting Mental Continuants shows that thoroughgoing eliminativism about mental continuants as a response to the problem is a tall order. While we cannot rule out at the outset that such a view could be made to work, even then it would be a surprising and interesting lesson if it turned out that a variant of the Problem of Too Many Mental Tokens motivates eliminativism about a broad range of *bona fide* mental entities.

[26] Philosophers who deny the existence of mental states include Robinson (1990) and Steward (1997).

A second possible response is analogous to one of the less popular solutions to the problem of personal fission, which denies that the seemingly obvious claim that Leftom is numerically distinct from Rightom. According to this solution, when Tom undergoes fission, he becomes a multilocated object, wholly present where either offshoot is; 'Rightom' refers to it as it is on the right, and 'Leftom' also refers to it as it is on the left.[27] The analogous view about thoughts is that Tom's soothing thought survives as both Rightom's thought and Leftom's thought, which are one and the same multilocated thought. The multilocation solution to the problem of personal fission challenges the boundaries of personhood, and in a similar fashion the multilocation solution to the Problem of Splitting Mental Continuants challenges the boundaries of the concept of a mental state. More importantly, it's not even clear that taking this radical step solves the problem it's meant to address. First, take the epistemological problem, which arose from the assumption that for certain types of 'I'-beliefs, people who will undergo fission host two indistinguishable token 'I'-beliefs. The multilocation solution allows us to deny that this assumption: Tamar hosts only one 'I'-belief with the content, "I will see my children grow up", and this belief is identical to both Rightamar's and Leftamar's post-fission token belief, which in turn are identical to each other. Is this belief *true*? Perhaps we should say that if Rightamar is identical to Leftamar (this requires us to adopt the multilocation solution to the problem of personal fission as well), then it is.[28] Yet, we can be excused for feeling that if Leftamar is right to think that she will see her children grow up only because in a different location she's Rightamar, and Rightamar will see her children grow up, then there is still something important that Leftamar gets wrong. There is *something* that Leftamar loses when her left hemisphere inevitably succumbs to cancer, and intuitively, Tamar can

[27] For this kind of view, see Miller 2006b: 329–32 and Wright 2006.

[28] *Pace* Mills 1993: 41–42, according to this line of thought.

legitimately wonder whether that loss will personally affect her. It may be difficult to give linguistic expression to the question that exercises her, but it doesn't seem that the multilocation solution renders the question irrelevant.

I'm similarly unconvinced that the multilocation solution solves the ethical problem. Granted, if fission involves the coming-to-be-multilocated of an individual token desire rather than the coming apart of qualitatively indistinguishable but numerically distinct desires, than we don't need to double-count the desire of a person who will split. However, we face a different problem: it seems that we now need to under-count the offshoots' desires. If you desire cake, and your 128 fission offshoots retain this desire, then according to the multilocation solution they all share numerically the same desire for cake. Therefore, giving "them" 128 slices of cake *after* fission isn't any better than giving me (who won't split) just one slice of cake; for in both cases you satisfied the same number of desires. I consider this an absurd result, which undermines the motivation for accepting the possibility of multilocated mental continuants (already a hard pill to swallow in and by itself).

The Problem of Splitting Mental Continuants is a serious problem that requires further study, and which cannot be ignored in accounts of fission. As of now, I'm not sure how to solve it; every solution that I was able to come up with seems to me to have prohibitive costs. But I see awareness of the problem as valuable in itself. The problem shows that a full account of fission cannot ignore questions about the identity of mental continuants. Moreover, it reveals interesting and hitherto unnoticed connections between personal identity and the ontology of the mental, which should inform our theorizing about both issues going forward.

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