

# Occasional Identity or Occasional Reference?

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**ABSTRACT:** André Gallois argues that individuals that undergo fission are on some occasions identical, but on others distinct. Occasional identity however, is metaphysically costly. I argue that we can get all the benefits of occasional identity without the metaphysical costs. On the proposed account, the names of ordinary material objects refer indeterminately to stages that belong to reference classes determined by the context of utterance or temporal adverbs. In addition, temporal markers indicating the perspective *from* which we count objects and assign properties to them determine how many count and what is true of them. So, as Gallois holds, the truth value of claims about what is true *at a time* may change over time and, where fission or fusion occur, does change. The current account, however, secures this result without commitment to occasional identity: reference, predication and counting are “occasional”; identity is not.

**KEYWORDS:** Fission, identity, occasional identity, persistence, reference, survival.

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André Gallois (1999) argues that individuals that undergo fission are on some occasions identical but at others distinct. However, while occasional identity makes sense of fission cases it is metaphysically costly. I argue that we can get all the benefits of occasional identity without the metaphysical costs: reference, predication and counting are “occasional”; identity is not.

## 1. Amoebas

At  $t_1$ , AMOEBAs are in a pond about to undergo fission; at  $t_2$ , after fission, one daughter amoeba, SLIDE, is on a microscope slide while the other, POND, is in the ancestral pond. What shall we say about SLIDE and POND? Agreed: at  $t_2$ , SLIDE is in the lab on a slide while POND is the pond. Let us grant, further, that AMOEBAs survives as SLIDE and POND, so that each *is* AMOEBAs, the individual in the pond at  $t_1$ . SLIDE and POND are

therefore identical at  $t_1$ . Since they are identical at  $t_1$ , they must have the same properties at  $t_1$ . At  $t_1$  POND is going to be in the pond at  $t_2$  so SLIDE is going to be in the pond at  $t_2$  also. But at  $t_2$  SLIDE is on a slide and, once fission occurs, she is *not* going to be in the pond at  $t_2$ . So there appears to be a contradiction:

(1) SLIDE is going to be in the pond at  $t_2$ .

and

(2) SLIDE is *not* going to be in the pond at  $t_2$ .

There are various ways to avoid contradiction. One way is to ignore properties that an individual has at a time in virtue of states of affairs that obtain at other times, so that sentences that purport to ascribe such properties to individuals are without truth value. On this account neither (1) nor (2) is true – or false. This is however an unattractive solution: very few properties assigned to ordinary, persisting material objects are instantaneous time-slice properties. Alternatively, we can reject the assumption that AMOEBA survives as SLIDE and POND. Understood in this way, fission does not occur: AMOEBA is *replaced* by her daughter amoebas.<sup>1</sup> This is not however an attractive option in the case of personal fission, which is to be considered.

### 1.1. Occasional identity

Gallois has proposed that where fission occurs, identity holds *temporarily* on the individuals involved. At  $t_1$ , there is just one amoeba in the pond, viz. AMOEBA (a.k.a. SLIDE, a.k.a. POND): SLIDE = POND. At  $t_2$ , there are two amoebas – one in the lab, the other in the pond: SLIDE  $\neq$  POND. On Gallois's account, SLIDE and POND do not merely share stages before fission: they are strictly identical. When we count the individuals around at any given time we count by strict identity – not by “tensed identity”<sup>2</sup> or some other relation. Strict identity is, however, occasional: there was one amoeba before fission – two afterwards.

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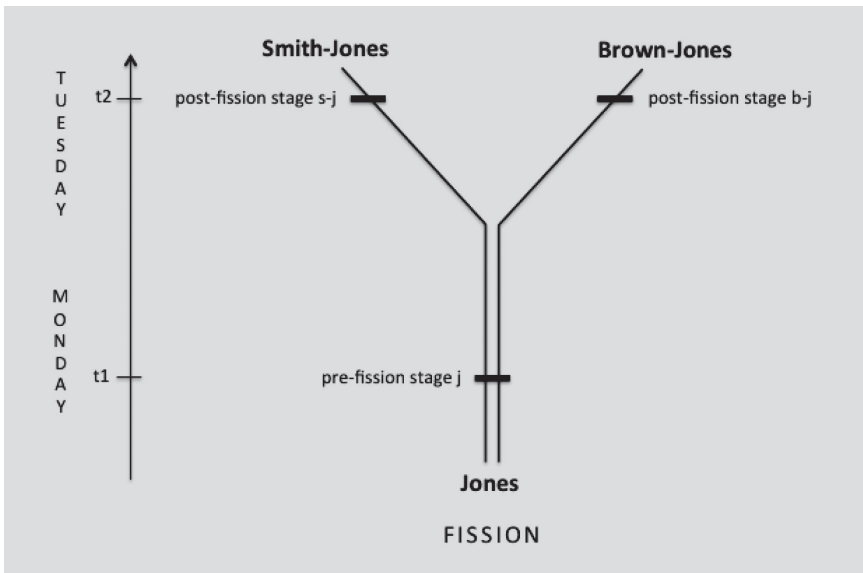
<sup>1</sup> When considering the prospects of amoebas, first-person-perspectival concerns don't cloud our intuitions. This solution is nevertheless problematic even apart from such concerns. Suppose that instead of undergoing fission, AMOEBA loses half of her cytoplasm but subsequently recovers, grows back to normal amoebic proportions and, at  $t_2$  finds herself on a microscope slide. In this scenario, intuitively, AMOEBA survives – as SLIDE. (Humans, after all, can survive the loss of half their body weight and the all but inevitable weight gain that follows). But then we are hard pressed to claim that where POND *does* survive, SLIDE is not AMOEBA. Intuitively, identity is intrinsically grounded if it is grounded at all: AMOEBA'S survival as SLIDE should not depend upon non-accompaniment by POND. While our intuitions are not decisive, it may be worthwhile to consider alternatives.

<sup>2</sup> The relation that holds on individuals when they share stages.

On this account, moreover, time-indexed properties generally are occasional – that is to say, an individual may have a property  $P$ -at- $t$  at some time,  $t_1$  but fail to have  $P$ -at- $t$  at another time,  $t_2$ . And so it is with individuals that undergo fission. At  $t_2$  and all other post-fission times, SLIDE is not in-the-pond-at- $t_2$  but, before fission, at  $t_1$  SLIDE *is* in-the-pond-at- $t_2$ . This is as it must be if we admit time-indexed properties and understand the relation that holds on fission-survivors before fission as strict identity. POND is in the pond at  $t_2$  so, at  $t_1$ , she is going to be in the pond at  $t_2$ . Since SLIDE is strictly identical to POND before fission, at  $t_1$  the same will be true of SLIDE. Occasional identity requires that time-indexed properties be occasional.

This is a point in the theory's favor: where fission occurs, we *do* intuitively want to say that different things are true of individuals at the same time *from different temporal perspectives*. The following puzzle-case of personal fission pumps this intuition:

Jones, who subsequently undergoes fission, is in Duplication Center Room 100 on Monday at  $t_1$ . At  $t_2$ , on Tuesday, she (they?) is (are?) back in Room 100, in twin beds A and B whose occupants are baptized "Smith-Jones" and "Brown-Jones" respectively.<sup>3</sup>



Enter a naïve subject. Asked on Monday how many people are in Room 100 he confidently answers, "one" – even knowing that Jones is about to undergo duplication, a procedure he believes is safe and completely relia-

<sup>3</sup> This, with only a slight tweak, is the story Perry (1972) tells.

ble. On Tuesday Naïve Subject is asked once again how many people are in Room 100 and answers with equal confidence, “two”: Smith-Jones in Bed A and Brown-Jones in Bed B. Smith-Jones and Brown-Jones each claim to be the person in Room 100 prior to duplication, and each has the appropriate (faux?) memories to support her claim. *Naïve Subject believes both of them.*

This is the gotcha moment! Philosopher reminds Naïve Subject that *on Monday* he held that there was just one person in room 100 but now, on Tuesday, claims that there are two distinct people, *each of whom* was in Room 100 on Monday – which is to say he holds that that there were two people in Room 100 *on Monday*. That, Philosopher says, is a contradiction: “there was exactly one person in Room 100 on Monday and there was *not* exactly one person in Room 100 on Monday”.

In what follows we shall see that Naïve Subject, whose intuitions are accommodated by Gallois’s account, is correct: on Monday, Smith-Jones = Brown-Jones on Monday but on Tuesday Smith-Jones ≠ Brown-Jones on Monday. I argue, however, we can achieve this result without invoking occasional identity.

### *1.2. A stage-theoretical alternative to occasional identity*

The alternative I propose assumes the “stage view”, according to which ordinary material objects are instantaneous *stages*. On every stage-theoretical account names of such ordinary objects are systematically ambiguous – referring to different stages at different times or within different contexts. It is nevertheless controversial how reference is determined. According to the stage theory popularized by Ted Sider (1996, 2001), the utterance of a name refers to the stage concurrent with the utterance if there is such a stage. Where there is no suitable current stage to serve as the referent, however, sentences that purport to be about individuals are to be understood as existential and general.<sup>4</sup> On this account, so long as Socrates was going about his business, corrupting youth and hassling fellow Athenians, the sentence “Socrates is wise” (or its Greek counterpart) was a simple singular statement ascribing wisdom to the Socrates-stage concurrent with the time of utterance; once Socrates succumbed to the hemlock its underlying grammar changed to logical gobbledygook:  $WAS(\exists x)(Sx \ \& \ Wx)$ . Such an account is disconcertingly disjunctive.

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<sup>4</sup> “If I say ‘Clinton was once governor of Arkansas’, we may take this as having subject-predicate form [...] The sentence ‘Socrates was wise’ cannot be a *de re* temporal claim [...] Syntactically, the sentence should be taken as the result of applying sentential operator ‘WAS’ to the sentence ‘Socrates is wise’; the resulting sentence means that at some point in the past, there is a Socrates-stage that is wise.” (Sider 1996: 450)

Sider's original rendition of the stage view is also disjunctive when comes to counting. Stage theories yield the intuitive correct count of individuals at any given time, counting synchronically, in both ordinary and branching cases: at any given time,  $t$ , there are as many individuals at  $t$  as there are stages at  $t$ . But the stage view makes counting the individuals around during non-momentary time-intervals problematic. How many ships passed through the harbor during a 24-hour period? There were innumerable ship-stages – more than the intuitive number of ships. But no time-slice count during the period selects the intuitively correct number of ships that passed through the harbor during that period, since ships come and go. In response, Sider (1996: 448) proposes a “partial retreat”: when counting timelessly, worms rather than stages are to be counted.<sup>5</sup>

Later iterations of the stage view have addressed both of these concerns. Sider himself has more recently endorsed a *perspective theory* according to which the context of a counting sentence determines the temporal boundaries of the objects that count. “The response”, Sider (2009: 19) writes, “employs the notion of a *perspective* from which a sentence is uttered [...] [which] determines the range of (unembedded) quantifiers, referents of names, and what objects satisfy ordinary predicates.”

While the introduction of perspective represents an improvement, arguably, Sider's revised theory is not sufficiently perspectival. We want a grand unified theory that treats the living and the dead equitably, counts the same kinds of things, viz. stages, whether counting synchronically or “timelessly” and which, finally, provides a rationale for assigning different *time-indexed properties* to individuals from different temporal perspectives – so that, e.g. at  $t_1$  SLIDE is in the pond at  $t_2$  but at  $t_2$  SLIDE is not in the pond at  $t_2$ . And that is what the account sketched in the following sections is intended to deliver.

## 2. Shifting reference

*Prima facie*, individuals that undergo fission are at time identical but at other times distinct. This appears to be a contradiction:

(3) At  $t_1$  SLIDE = POND

and

(4) At  $t_2$  SLIDE  $\neq$  POND.

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<sup>5</sup> “If we take the ‘timeless perspective’ and ask how many people there ever will be, or how many people have been (say) sitting in my office during the last hour, the stage view seems not to have an easy answer. [...] The stage view should be restricted to the claim that *typical* references to persons are to person stages. But [...] when we take the timeless perspective, reference is to worms.” (Sider 1996: 448)

But without either opting for occasional identity or dismissing this claim outright, stage theorists, who already recognize names as systematically ambiguous, can provide an account of how reference shifts in fission cases so that there is no contradiction.

*Prima facie*, the stage view admits too many candidates for reference. If names refer to stages, talking about ordinary material objects poses the familiar problem of the many since continuum-many stages will answer to any name. In response, Sider suggests that in sentences like (5) we are talking about the stage concurrent with the time of utterance:

(5) Obama is American.

Understood in this way, (5) says *of* Obama-now that it is personal-counterpart-related to a past born-in-America stage. Sider however rejects this reading of sentences that purport to be about Socrates on the grounds that absent a current stage, the selection of any other stage would be arbitrary – hence his disjunctive account.

Contrary to Birther's allegations, however, Obama is now and always has been American, so regardless of which Obama-stage we pick as the referent of "Obama", (5) will come out true: to that extent, it doesn't matter which stage is selected as the referent. "Often", David Lewis (1993: 172) remarks, "what you want to say will be true under all different ways of making the unmade decision". We shall, therefore, adopt a supervenient account of reference and embrace indecision. On this account there is, for every admissible precisification, exactly one stage that "Obama" selects from amongst a class of counterpart-interrelated stages. And, although it is indeterminate which one it is, it does not matter.

Unlike (5), however, some sentences, on their most natural reading, restrict reference-candidates to a range of stages indicated by temporal adverbs:

(6) In 2008, Obama lived in Illinois.

Here, the reference-candidates for "Obama" are, intuitively, just those Obama-stages that occurred in 2008. So, on the current supervenient account, the reference class of a name need not include all the counterpart-related stages from which it selects. Consequently, names are temporally flexible in two respects: first, the name of an individual refers indeterminately over a class of counterpart-interrelated stages; secondly, context and temporal adverbs select the class of stages to which a name indeterminately refers.

Since referring expressions are temporally flexible in this way we need to consider not only time at which properties are ascribed to an individual but also the time that selects the reference candidates. That will make a crucial difference to the truth value of sentences like (7), which is ambiguous:

(7) In 2008, the President lived in Illinois.

On one reading (7) directs us to 2008 Obama-stages; on another to 2008 Bush-stages. (7') is true, but (7'') is false:

(7') The 2015 president lived in Illinois in 2008.

(7'') The 2008 president lived in Illinois in 2008.

From any temporal perspective, a sentence of the form, “*N* has *P* at *t*”, is true just in case the set of candidate stages “*N*” selects from that perspective includes a stage-at-*t* that has *P*. Unlike “the President” and other definite descriptions, names are ordinarily *faux-rigid*: while they refer indeterminately to different individuals, i.e. different stages, they ordinarily select reference classes from the same maximal counterpart-interrelated sets of stages at every time. Where fission occurs, however, the same name may, at different times, select reference-classes belonging to different sets of counterpart-interrelated stages. And where fission occurs, the reference-candidates for a name selected from one temporal perspective may include a stage-at-*t* that has *P* while those selected from another temporal perspective do not. The reference candidates “SLIDE” selects before fission include stages that are in the pond at  $t_2$ ; the reference candidates it selects after fission do not. Previous sentences

(1) SLIDE is going to be in the pond at  $t_2$ ,

(2) SLIDE is *not* going to be in the pond at  $t_2$ ,

are ambiguous since they do not indicate any temporal perspective. Disambiguated as (1') and (2') respectively, however, they are not contradictory – both (1') and (2') are true:

(1') Before fission, SLIDE is going to be in the pond at  $t_2$ .

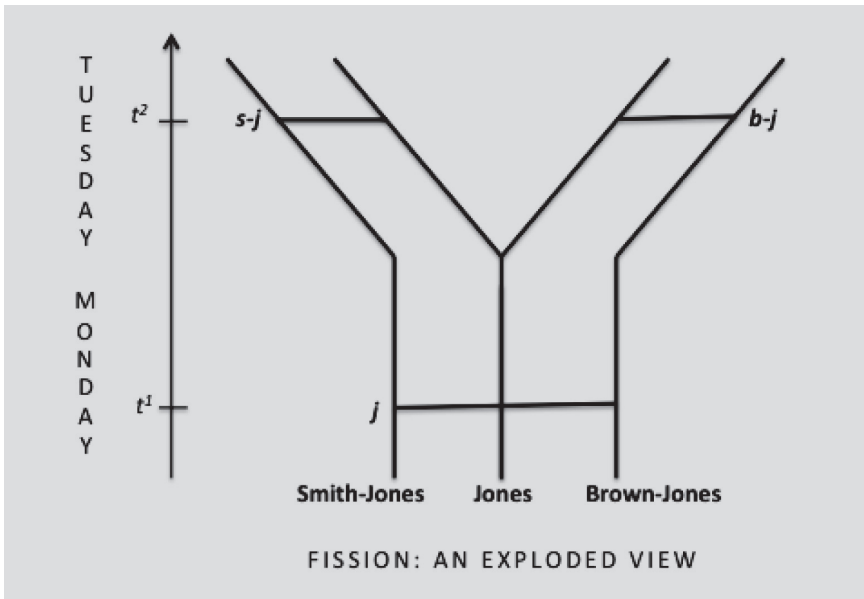
(2') After fission, SLIDE is *not* in the pond at  $t_2$ .

From the pre-fission perspective, “SLIDE” refers indeterminately to stages that are in the pond after fission as well as those that are then on the slide, so from the perspective of  $t_1$  SLIDE will be both on the slide and in the pond at  $t_2$ . From the post-fission perspective, the set of reference-candidates for “SLIDE” does not include stages that are in the pond after fission, so from that perspective (2) is true. There is no class of reference candidates that both includes and does not include a stage-at- $t_2$  in the pond, so there is no temporal perspective from which both (1) and (2) are true and, therefore, no contradiction. Likewise, in the story of personal fission, before fission, Smith-Jones is in Bed B before fission but afterwards she is not in Bed B before fission. We now return to that scenario in order to explain *how* temporal perspectives select reference classes.

### 3. Personal fission

On the current account, stages are baptized<sup>6</sup> and transmit their baptismal names to their counterparts – stages to which they bear kind-specific unity relations. From any temporal perspective,  $t$ , a name, “N”, selects a reference-class from amongst counterparts of the stage-at- $t$  named “N”. Ordinarily, a name selects from amongst the same counterpart-interrelated stages from every perspective; where fission occurs it does not.

In the Smith-Brown-Jones case,  $j$ , a stage-at- $t_1$ , is baptized “Jones” and  $t_2$  stages  $s-j$  and  $b-j$  are baptized “Smith-Jones” and “Brown-Jones” respectively.  $j$  transmits the name “Jones” to its personal counterparts, represented by the Y-shaped structure:



$s-j$  and  $b-j$  transmit the names “Smith-Jones” and “Brown-Jones” to their personal counterparts, represented by the branches on the left and right sides respectively. The name “Smith-Jones” thus selects different reference-classes of stages from different temporal perspectives, of which some include stages in Bed B on Tuesday and others do not.

<sup>6</sup> Baptism, like reference, may be indeterminate over stages, as it is in cases of posthumous baptism – as, for example, when scientists baptized a primitive hominid whose bones were discovered in 1974 “Lucy” or when historians, centuries after the Fall of Constantinople, baptized a geopolitical entity “the Byzantine Empire”.



Before fission, the names “Smith-Jones” and “Brown-Jones” are not in use. Semantic baptism is however retrospective: the names with which *s-j* and *b-j* are baptized propagate to pre-fission stages – so every pre-fission stage involved in the fission case retrospectively inherits the names “Smith-Jones” and “Brown-Jones”. From Monday and other pre-fission perspectives, “Smith-Jones” selects referents from amongst counterparts of *s-j*'s *pre-fission* counterparts – the class of stages represented by the Y-shaped structure. Each of these pre-fission Smith-Jones stages has Tuesday counterparts in Bed B as well as Bed A so:

(8) On Monday, Smith-Jones will be in Bed B on Tuesday.

From Tuesday and other post-fission perspectives however, “Smith-Jones” selects reference-classes from amongst counterparts of *s-j*'s *post-fission* counterparts, viz. stages on the left branch only. The counterpart relation is not transitive and no post-fission *s-j* counterpart has a counterpart on the right branch. None of *s-j*'s post-fission counterparts are in Bed B on Tuesday so:

(9) On Tuesday, Smith-Jones is not in Bed B on Tuesday.

As reference goes, so identity and counting go. *s-j* and *b-j* have the same pre-fission counterparts so, at any pre-fission time, *t*, *s-j*'s counterpart-at-*t* = *b-j*'s counterpart-at-*t*, hence:

(10) On Monday, Smith-Jones = Brown-Jones on Monday.

*s-j* and *b-j* do not share any post-fission counterparts. So no post-fission stage inherits both “Smith-Jones” and “Brown-Jones”, thus:

(11) On Tuesday, Smith-Jones ≠ Brown-Jones on Monday.

Naïve Subject is therefore correct. On Monday, there is one person in Room 100 on Monday; on Tuesday there were two people in Room 100 on Monday. There are no individuals that are identical on some occasions but not on others. Rather, different individuals, that is, different stages, count on different occasions. On Tuesday it is post-fission stages whose identity is in question and no post-fission stage is a counterpart to both *s-j* and *b-j*.

Naïve Subject is also correct in believing on Tuesday that Smith-Jones and Brown-Jones are distinct but that each is identical to Jones. Each post-fission counterpart of *s-j* and each post-fission counterpart of *b-j* is a post-fission counterpart of *j* so

(12) On Tuesday, Smith-Jones = Jones on Tuesday.

(13) On Tuesday, Brown-Jones = Jones on Tuesday.

At every post-fission time there are two distinct concurrent *j*-counterparts – one of which is an *s-j* counterpart and the other a *b-j* counterpart. (12) is

true because for every post-fission time,  $t$ ,  $s$ - $j$ 's counterpart-at- $t$  is identical to one of  $j$ 's counterparts-at- $t$ ; (13) because for every post-fission time,  $t$ ,  $b$ - $j$ 's counterpart-at- $t$  is identical to another one of  $j$ 's counterparts-at- $t$ . But there is no post-fission time,  $t$ , when  $s$ - $j$ 's counterpart-at- $t = b$ - $j$ 's counterpart-at- $t$  so

(14) On Tuesday, Smith-Jones  $\neq$  Brown-Jones on Tuesday.

Names of ordinary material things are, at best, faux-rigid: a name refers, indeterminately, to different stages, and the range of stages to which a name refers may vary. To that extent *all* names are ambiguous. On Tuesday, however, "Jones" is *strongly ambiguous*: it selects reference candidates from two non-overlapping classes of  $j$ 's post-fission counterparts. (12) is true on one disambiguation of "Jones", where it refers indeterminately to post-fission stages on the  $s$ - $j$  branch; (13) is true when "Jones" refers indeterminately to stages on the  $b$ - $j$  branch so (12) and (13) are ambiguous, and should be disambiguated as:

(12') On Tuesday, Smith-Jones = Jones <sub>$s$ - $j$</sub>  on Tuesday.

(13') On Tuesday, Brown-Jones = Jones <sub>$b$ - $j$</sub>  on Tuesday.

So (14) does not violate transitivity of identity.

The current account therefore delivers all the benefits occasional identity provides for fission cases without the metaphysical cost.

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