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S.I.: MEREOLOGY AND IDENTITY

Coincidence as parthood

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Abstract
There are three families of solutions to the traditional Amputation Paradox: Eliminativism, Contingent Identity Theories, and Theories of Coincident Entities. Theories of Coincident Entities challenge our common understanding of the relation between identity and parthood, since they accept that two things can be mereologically coincident without being identical. The contemporary discussion of the Amputation Paradox tends to mention only one theory of Coincident Entities, namely the Constitution View, which violates the mereological principle of Extensionality. But in fact, there is another theory, namely the Unique Part View, which violates another mereological principle (the Weak Supplementation Principle). In this paper, I argue that the contemporary focus on the Constitution View is unmotivated, at least when we are confronted with the Amputation Paradox, and that a balanced comparison of the two views (as solutions to this specific paradox) should favour the Unique Part View.

Keywords Coincident Entities · Weak Supplementation Principle · Amputation Paradox · Material constitution · Parthood · Extensionality

1 Introduction

The Amputation Paradox is one of the most ancient philosophical conundrums concerning compound objects and material constitution. The first version, involving a man Dion who has his leg amputated, was probably invented by the Stoic Chrysippus in the Hellenistic period. The paradox was resurrected in modern times by David Wiggins (who attributes it to Peter Geach), and involves the cat Tibbles who has its tail amputated. I will start with a slightly different version, which avoids a certain number of difficulties with the more traditional variants. It involves the scenario of a person whose brain is severed from the rest of his body and maintained in life in a

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vat of nutrients, so that the person can survive the operation "reduced to his brain", so to speak. For simplicity, we will call this the scenario of "brain amputation".[1]

Here is a first statement of the paradox: consider Bob before his brain amputation and after his brain amputation. The scenario stipulates that Bob *survives* the brain amputation, so he exists both before and after the amputation. But it would seem that the brain also survives the amputation—let us use "Brain" (with capital B) as a proper name for Bob's brain. Brain, seemingly, also exists before and after the amputation. The problem is the following: if both Bob and Brain exist after the amputation, what is the relation between Bob and Brain at that time? One would think that they are just *identical* after the amputation, since they are exactly *coincident* (at least in the sense that they occupy exactly the same portion of space, and have exactly the same material parts). But the problem is that they were not identical *before* the amputation, and it would seem that two distinct things cannot "become identical"! Or could they? Could it be that the relation of identity is just a temporary and contingent relation? At least this doesn't seem intuitive. And therefore, we cannot easily say what the relation is between Bob and Brain after the amputation.

The paradox can be summarized as a conflict between the following five intuitions:

(1) Bob and Brain both exist before and after amputation.
(2) Bob and Brain are two distinct things before amputation.
(3) Bob and Brain are coincident after amputation.
(4) It is not possible for two distinct things to be coincident.
(5) Identity is a necessary relation.

The three main (families of) responses to the paradox, according to Michael Rea (Rea 1997), are the following:

> Rejecting premise (1): Eliminativism(s).
> One could deny that the two entities (Bob and Brain) exist before and after amputation. There are different ways to go here: one could reject either the existence of Bob, the existence of Brain, or the existence of both, and this either before amputation, after amputation or both.[2]

> Rejecting premise (5): Contingent Identity.
> One could choose to revise the intuition that two distinct things cannot "become" identical. This implies a rather drastic revision of the logic of identity, which many philosophers are reluctant to swallow.

[1] Although it is arguably more accurately described as an amputation of everything *but* the brain.

[2] Mereological Nihilism denies the existence of both Bob and Brain, both before and after amputation. Peter van Inwagen only rejects the existence of Brain before the amputation, i.e. the existence of Brain as an "undetached part". This solution is somewhat attractive when we are dealing with other amputation scenarios, in which we are asked to give names to such arbitrary parts as "the tail-complement of Tibbles, named Tib" (are there really any such things as "tail-complements"?). But it seems much harder to deny the existence of *brains* (even as "undetached" parts). That's one reason why I prefer the brain-amputation scenario.

> Rejecting premise (4): Coincident Entities.
> The third family of solutions consists in rejecting premise (4), and saying that two entities can be coincident and yet be two numerically distinct things. Bob and Brain exist after the amputation just as they existed before, and they remain *numerically distinct* after the amputation although they come to be exactly coincident.

The attraction of the third solution is mainly due to the counter-intuitivity of the other two options: one should probably not fiddle with the logic of identity just to solve material problems, and secondly Bob and Brain exist, don't they? Some philosophers think that 4-dimensionalism, or the doctrine of temporal parts, is a fourth (and better) way to solve the conundrum; but I follow Michael Rea (*ibidem*) in thinking that 4-dimensionalism does not adequately generalize to other formulations of the problem (in particular: *modal* versions of the amputation scenario instead of *temporal* versions), and for that reason cannot be considered as a general solution to the philosophical problem itself. Notice that if 4-dimensionalism were considered as a general solution to the problem, it would *not* be a solution in which there are two distinct and yet coincident things.[3]

Given all this, it seems that the only option left is to accept that Bob and Brain can become coincident without becoming identical. Granted, it does seem somewhat weird, but according to the defenders of this view it is the least weird thing one can say when confronted with the Amputation Paradox. And many philosophers since (Wiggins 1968) have thought that this was the best way to go, so many in fact that the theory of Coincident Entities is sometimes presented as the "Orthodox View" (Blatti 2012, p. 151) or the "Standard Account" (Burke 1992).

In this paper, I will not try to argue in favour of the theory of Coincident Entities. I will be addressing a debate that takes place (or should take place) *between* defenders of this view. There are in fact two distinct versions of the theory that are being discussed in the contemporary literature, namely: the Constitution View and the Unique Part View. But for some reason, the first of these views is more often than not presented as the official version, or sometimes even as *the* theory of Coincident Entities.[4] In this paper, I want to open the debate between these two contenders as solutions to the Amputation Paradox: once one has accepted that there can be Coincident Entities, which version should we rather adopt in order to solve the Amputation Paradox? And I will present some arguments to the effect that, at least in the case of the Amputation Paradox, the Constitution View has no good reason to be considered as the default version or indeed the most plausible one.

But before I do that, I would like to introduce another version of the paradox which will be helpful at some points of the discussion, namely a *dualist* version of

[3] The temporal part of Bob after amputation and the temporal part of Brain after amputation would be coincident but also identical things, while Bob as whole (with all his temporal parts) and Brain as a whole (with all its temporal parts) would be distinct things but not coincident.

[4] This is the what happens in Michael Rea's presentation of the debate (Rea 1997), in (Olson 2006), in (Blatti 2012), or in (Wasserman 2015).

the paradox, which is mentioned by Achille Varzi in the context of the discussion of some mereological principles. Here is Varzi's presentation:

> Consider the view, arguably held by Aquinas, according to which the human person survives physical death along with her soul. On the understanding that persons are hylomorphic composites, and that two things cannot become one, the view implies that upon losing her body a person will continue to exist, pre-resurrection, with only one proper part—the soul.
> (Varzi 2016)

If we set aside for a moment the details of the solution attributed here to Aquinas, it is clear that the *problem* that is here being addressed is formally exactly the same as the paradox of Bob and Brain. The only difference is that instead of having a compound of Brain and Organ1, etc., OrganN being reduced to just its Brain, we have a compound of Soul and Body being reduced to just its Soul. For convenience, we can formulate the *Problem of Disembodiment* (or the problem of the disembodied soul) as being a conflict between the following five propositions:

(1d) Sally and Soul both exist before and after disembodiment.
(2d) Sally and Soul are two distinct things before disembodiment.
(3d) Sally and Soul are coincident after disembodiment.[5]
(4) It is not possible for two distinct things to be coincident.
(5) Identity is a necessary relation.

Of course, many people will be happy to reject premise (1d) by denying the existence of immaterial souls and the survival of disembodied persons. And I have no intention to defend here the plausibility of substance dualism. I am interested here in the dualist version of the problem for the same kind of reasons that Descartes' scenario of the Evil Demon can still be of heuristic interest to philosophers, even though we also have a materialist version of basically the same problem—namely the Brain in a Vat scenario. The Problem of Disembodiment is to the Amputation Paradox exactly what the Evil Demon scenario is to the Brain in a Vat scenario: it can still be, at times, heuristically helpful even though its dualist component in itself is unpalatable and outdated for most contemporary philosophers.

[5] One might wonder what it means for Sally and Soul to be "coincident" after disembodiment: it cannot mean that they are made of the same "matter", nor that they occupy the same spatial location since Soul is immaterial and non spatially located. In first approximation, (3d) is meant to capture the intuition that "Sally is reduced to just her soul after disembodiment". In section 2, I will provide a more careful definition of Sally and Soul's coincidence as *mereological* coincidence, i.e. being composed by the same things. Of course, this presupposes that Soul is not a mereological atom, a claim which most actual dualists would reject; but this presupposition will not be a problem here since I am not at all in the business of trying to defend the actual *plausibility* of the dualist model that I discuss. Thanks to an anonymous referee for suggesting this clarification.

Now for some hypothetical philosopher who *is* a dualist, the solutions at hand are just the same three solutions which we had seen for the Amputation Paradox.[6] And for roughly the same reasons, it is easy to see why the theory of Coincident Entities could appear palatable to our hypothetical dualist confronted with this paradox. As we will see, though, the *version* of Coincident Entities Theory most typically defended by past and present dualists is not the same as the version typically defended for the Amputation Paradox. This is where the dualist paradox will be heuristically helpful in the discussion of its materialist counterpart.

In the first two sections of this paper, I will present briefly the two different Theories of Coincident Entities, starting with the one which holds centre stage in the contemporary literature on the Amputation Paradox (the Constitution View), then turning to the one which seems to be more popular in the context of the dualist Problem of Disembodiment (the Unique Part View). Then, in Sect. 4, I will present a new argument against the Constitution View as a solution to the Amputation Paradox (the Intrinsicality Argument), which seems to me to give good reason to look for an alternative solution. Finally, in Sect. 5, I will discuss the main traditional argument against the Unique Part View (the Analyticity Objection), and I will argue that this worry can be assuaged, so that the Unique Part View remains a serious contender. The take home message would be that the Unique Part View is probably the best version of the Coincident Entities solution when we try to account for the Amputation Paradox. One important thing to notice from the start is that the Constitution View of Coincident Entities has been defended for *other* scenarios and other cases than the Amputation Paradox, and my arguments in this paper will be compatible with saying that the Constitution View is required in order to account for these other cases. Therefore, this paper is not an argument against the Constitution View *in general*, but an argument against the Constitution View (and for the Unique Part View) *as a solution the Amputation Paradox*.

2 The constitution view (Coincident Entities without mereological extensionality)

The first theory of Coincident Entities was first introduced not as a solution to the Amputation Paradox but as an account of a different presumptive case of Coincident Entities, namely the case of "the Statue and the Clay".

Consider a lump of clay (call it Lumpl) which represents nothing at t1, then gets shaped into a statue of Goliath at t2, and then gets squashed back into a mere

[6] More precisely, the hypothetical philosopher would have to be a *Compound* Dualist, in Olson's terminology (Olson 2001): a *Simple* Dualist holds that the person (even before disembodiment) is just a soul, and not a compound of soul and body. For that reason, a Simple Dualist rejects premise (2d). The Compound Dualist on the other hand is precisely one who endorses premise (2d). Premise (3d) on the other hand is just as much a component of the scenario itself as was premise (3) for the Amputation Paradox.

lump of clay at t3. It seems that at t2 we have both the lump of clay (Lumpl) and a statue (Goliath) exactly coinciding, even though they are not identical (Lumpl has the property of having existed at t1, a property Goliath hasn't). Of course, in this scenario, one could also be tempted to go the eliminativist way, or the way of contingent identity; but this is not what we are interested in here: we're discussing here with philosophers who agree about the possibility of "Coincident Entities", and among these philosophers, many will take this scenario of the Statue and the Clay to be *the best heuristic* (or the typical case) for developing a Theory of Coincident Entities.

How should we describe the scenario of the Statue and the Clay? The three tenets of the mainstream Constitution View are the following:

(i) Lumpl and Goliath *coincide*, and they coincide not only in terms of spatial location, but also in terms of their parts;
(ii) in spite of being (spatially and mereologically) coincident, they are not identical;
(iii) rather, they stand in a *sui generis* relation which is called "constitution" (and which is neither identity nor parthood).

Let me say a bit more on these three conditions.

What does it mean to say that Lumpl and Goliath "coincide in terms of their parts (or mereologically)"? The official and careful definition of mereological coincidence presupposes the notion of "composing":

> the xs compose y
> [is] an abbreviation for
> the xs are all parts of y and no two of the xs overlap and every part of y overlaps at least one of the xs (Van Inwagen 1990, p. 29)

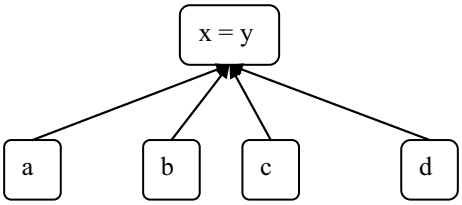
Suppose we consider all the atoms that are in the statue Goliath: each of these atoms is a part of Goliath, no atom overlaps another atom, and every part of Goliath overlaps at least one of these atoms. Therefore, according to this definition, they (collectively) compose Goliath. But we could make exactly the same reasoning about Lumpl and arrive at the same conclusion that exactly the same atoms (collectively) compose Lumpl. Goliath and Lumpl are such that there are atoms (the *same* atoms) which compose both of them. And this is the precise definition of mereological coincidence:

> x coincides mereologically with y if and only if some things, the zs, compose x and also compose y. (see e.g. Olson 2007, p. 49)

Alternatively, we could also say that x and y "share a common composition base" (namely the zs that compose x and also compose y).

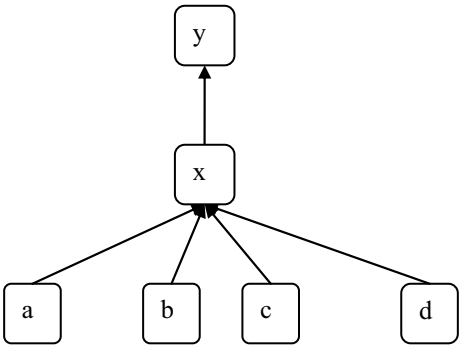
From a logical point of view, there are four (and only four) possible configurations in which x and y share a common composition base.

(1) Coincidence as Identity: x is identical with y (or equivalently: x is a part of y *and* y a part of x).



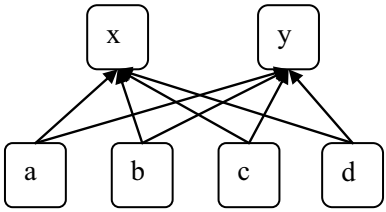
This case of coincidence is trivial but is not what we are looking for, as has been explicitly stated by condition (ii) above ("in spite of being coincident, x and y are not identical"). We have to focus on cases in which x and y share a common composition base *and yet* are distinct. In other words, we have to consider cases in which x and y are not *parts of each other*. The first option is to keep one direction of parthood, and say that x is part of y *but not* vice versa. Now, if x is a part of y and some composition base of x is a composition base of y, it follows that, in y (the "whole" of which x is a part), there is no "supplement" to x. Or in other words, that x is "the unique part" of y.

(2) Coincidence as (Unique) Parthood: x is the unique part of y



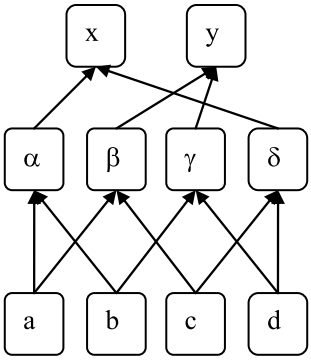
The third and fourth possibilities of coincidence arise when we assume that neither coincident is part of the other. When two entities have a common composition base and yet neither is part of the other, the solution that most easily comes to mind is that the common composition base represents *all the parts* of both objects, or in other words that they have all their parts in common.

(3) Coincidence as "Same Parts": x and y share all the same proper parts



Finally, if we posit that x and y do *not* share all the same proper parts, there is still a way for them to share a common composition base, as an anonymous reviewer brought to my attention. This will happen when (and only when) there are some intermediate parts, between x and the composition base, intermediate parts that are not parts of y (or vice versa). I will call these cases "diverging composition", because the same composition base comes to compose x and y in diverging ways (or through different intermediaries).

(4) Coincidence as Diverging Composition: x and y have a common composition base, but x and y are not part of each other, and x and y do not share all the same parts.



It is important to note, right from the start, that solutions 2, 3 and 4 all violate some principle of Classical Extensional Mereology.

Solution 2 violates the so-called Weak Supplementation Principle (WSP):

$$\mathrm{PP}xy \rightarrow \exists z(\mathrm{P}zy \wedge \neg \mathrm{O}zx)$$

If x is a proper part of y, then there is a z which is a also a proper part of y and is disjoint from x.

Solution 3 violates the "axiom of extensionality" (EXT):

$$\forall z(\mathrm{PP}zx \leftrightarrow \mathrm{PP}zy) \rightarrow x = y$$

If x and y have all the same proper parts, then they are identical.

Solution 4 doesn't violate WSP nor EXT, but it violates the Strong Supplementation Principle (SSP):

$$\neg \mathrm{P}xy \rightarrow \exists z(\mathrm{P}zx \wedge \neg \mathrm{O}zy)$$

If x is not a part of y, then there is a part of x that is completely disjoint from y.

All this being clear, what kind of coincidence corresponds to the traditional account of the Statue and the Clay—the account labelled "the Constitution Theory"? One thing is absolutely clear: it cannot be solution 1. As the motto goes: "Constitution is not identity". After this essential point of agreement, things become murkier, because, as (Olson 2007, p. 50) noticed, "few of those who speak of constitution bother to say what they mean by it, and those who do say different things."

Nonetheless, it seems pretty consensual usage to use the word "constitution" to designate a *sui generis* relation completely distinct from parthood and indeed *incompatible* with parthood (whenever x constitutes y, x is not a part of y). This would rule out Coincidence as Parthood (i.e. solution 2; more on this below).

Furthermore, it is also very common to describe the case of the Statue and the Clay as one in which "Lumpl and Goliath share all the same parts" (solution 3), and to explicitly *define* the Constitution View as the one which rejects the axiom of extensionality. This definition is common not only in introductions and encyclopaedias (Blatti 2012; Wasserman 2015), but also in the works of some defenders of the Constitution View as, for instance, Lynne Baker:

> Coupled with rejection of mereological supervenience as a basis for metaphysics is rejection of the claim that if x and y have all and only the same parts, then x = y. (Baker 2000, pp. 180–81)

or Judith Jarvis Thomson:

> Why should it be thought that if x and y share all their parts at one time, it follows that they must at all times? (Thomson 1998, 171 note 5)

Michael Rea goes so far as to use the "sharing of the same parts" as the definition of "coincidence" and therefore of the "Coincident Entities theory":

> [To adopt this solution,] "one must hold that sometimes distinct objects have all of the same parts at the same time. For convenience, I call these "Coincident Entities" solutions". (Rea 1997, pp. xxviii–xxix)

It should be noted that there are some authors who use the vocabulary of "constitution" without committing themselves to the rejection of extensionality (see e.g. Lowe 2013; Oderberg 2012). More importantly, Frederick Doepke (Doepke 1982) provided examples of constitution which fall under solution 4: Doepke noticed that a person is constituted by a certain collection of atoms (and coincides with this collection of atoms in the sense defined above) *and yet* there are arguably some

(intermediate) parts of the person that are not parts of the collection of atoms, for instance, the person's heart.[7]

In fact, Doepke's definition of constitution is such that it could embrace (at least in principle) *any* logically possible case of coincidence, with the exception of coincidence as identity, but including coincidence as parthood. Even though Doepke (1982, 1986) did not put forward any case of "constitution" that is also a case of Unique Part, his definitions could allow him to do so in view of the arguments developed in the present paper.[8] If someone wants to use the word "constitution" along those lines, I have no argument against him. The main thesis of my paper would only need to be reformulated as follows: "even though the traditional account of constitution is one in which the constituting thing is not a part of what it constitutes, I will show that amputation scenarios must be interpreted as scenarios in which the constituting thing is the unique part of what it constitutes."

But as a matter of stipulation, I will here use the word "constitution" in the narrow sense which excludes the Unique Part solution. In other words, I will use the phrase "the Constitution Theory" to designate any account of coincidence according to which the coincident things are not part of each other (i.e. the disjunction of solutions 3 and 4). This stipulation is both relatively faithful to common usage in recent writings on constitution, and useful for the purposes of this paper, since this terminology gives us a general denomination for the complement of the Unique Part View, for which I am here arguing.

Furthermore, even though solution 4 (Diverging Composition) is an interesting and legitimate case of Constitution (under the terminology I will use), yet for reasons of simplicity and clarity I will continue the discussion only with the particular case of "Same Parts" (solution 3), mainly because this is the case most frequently discussed in the recent literature. But it is crucial to note that the arguments I will provide (in Sect. 4) against the Constitution View are just as efficient against a Diverging Composition account (of Amputation Scenarios) as against a Same Parts account (of Amputation Scenarios).

To summarize, the Constitution View, which usually starts from the archetypical case of "the Statue and the Clay" states the following: it is possible for two distinct things to be exactly coincident; such a situation occurs when two things stand in the special relation of "constitution", namely when none is *part* of the other and (typically) when they share all the same parts.

Now that we have seen the Constitution View developed for the case of "the Statue and the Clay", let us see how it can be applied to the Amputation Paradox and to the Problem of Disembodiment.

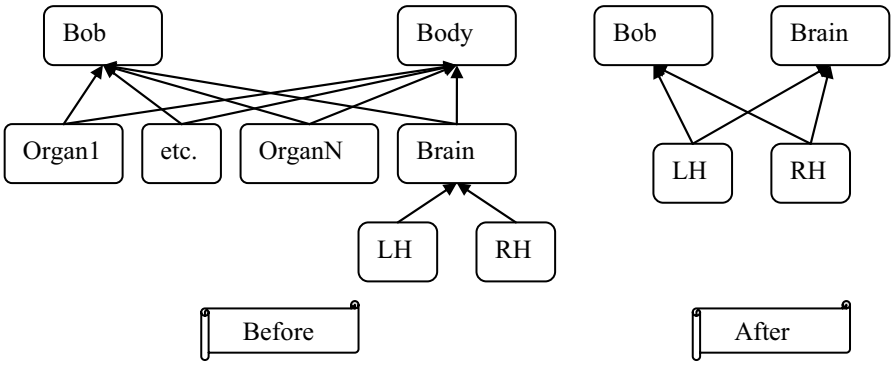
In the Amputation Paradox, the two distinct things that appear to be coincident are Bob and Brain after the amputation. If we follow the Constitution View, such a coincidence would be possible if Bob and Brain (i) have all the same proper parts, (ii) are not part of each other, and (iii) one constitutes the other. Concerning the

[7] In a similar vein, (Baker 2000, p. 181) or (Oderberg 2012, p. 16) have noticed that, in the case of Lumpl and Goliath, there is arguably some part of Goliath (its nose) which is not a part of Lumpl.

[8] Thanks to an anonymous reviewer for bringing my attention to this point.

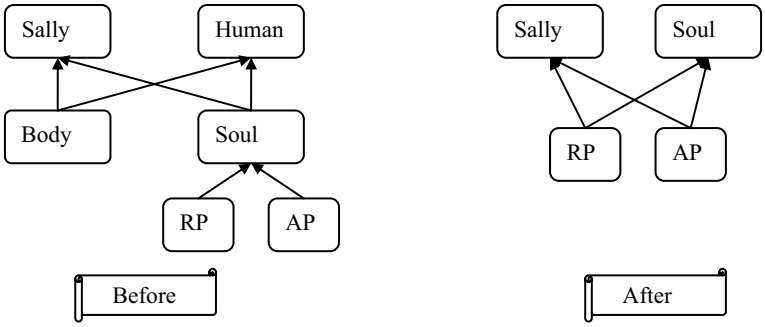
third clause, there is good chance that a Constitution Theorist will want to say that (after amputation), it is Brain that constitutes Bob, and not vice versa. But in the present paper, only the first two clauses are important. Suppose we say that Brain is composed of two proper parts, namely its left hemisphere, called LH, and its right hemisphere, called RH. It will follow from (i) that Bob (after amputation) is also composed of LH and RH (i.e. there is no part of Bob that does not overlap either LH or RH). Furthermore, clause (ii) tells us that there is no parthood relation whatsoever between Bob and Brain (there is *just* the special relation of "constitution" which is *not* a kind of parthood). This situation is represented in the right-hand side of the following picture.

Now, we should keep in mind that the difficulty of the Amputation Paradox comes largely from the *comparison* of the situations before and after amputation. So we should also represent and keep in mind what the Constitution View says about Bob (and Brain) *before* the amputation. Before the amputation, it seems obvious that Brain *was* a part of Bob, among other parts (legs, arms, etc. In the diagram, I will represent these by the open list of Organ1, etc., OrganN). So the amputation process turns something which was a part of Bob (namely Brain) into something which constitutes Bob. Now, presumably, the constitution theorist will want to say that before he was constituted by Brain, Bob was constituted by something else (something which *also* had Brain as a part, and also had Organ1, etc., OrganN as parts): I call it Body. Body, which is the sum of Organ1, etc., OrganN, *plus* Brain, may or may not cease to exist when Brain is severed from Organ1, etc., OrganN; whether or not it continues to exist, it ceases to have any interesting relation to Bob, so it disappears from our picture in the right-hand side. [NB: the arrows in all the diagrams below mean the "proper parthood" relation.]



How could the Constitution View account for the Problem of Disembodiment? To a large extent, one can follow exactly the same lines: just like Brain is part of Bob before amputation and becomes what constitutes Bob after amputation, one could say that Soul is part of Sally before disembodiment and becomes what constitutes Sally after disembodiment. There is just one difficulty here, which is that the soul is typically conceived as a mereological atom; in which case we couldn't say that Sally

and Soul coincide mereologically in the sense of having the same proper parts since Soul does *not* have proper parts at all. If I were trying to argue for the possibility (or the plausibility) of dualist disembodiment, perhaps I should try to defend that the constitution relation can be had between mereological atoms. But since my intention here is to take the dualist scenario only as a heuristic tool of comparison, I will resort to a much simpler solution, i.e. I will adopt a non-orthodox model according to which (immaterial) souls have (immaterial) parts. Inspired by Plato's theory of the soul, I will say Soul has a Rational Part (RP) and an Appetitive Part (AP). Together, RP and AP compose Soul; and after disembodiment they also compose Sally, which is constituted by Soul. *Before* disembodiment, Sally was constituted by something else, namely a compound of Body and Soul, which I call Human.



Such is the first version of the theory of Coincident Entities, i.e. the Constitution View. In terms of mereology, the gist of this solution is to deny the axiom of Mereological Extensionality and to say that the relation between the constituting thing and the constituted thing is *not* a relation of parthood. This version is not only the first kind of Coincident Entities Theory; it is more often than not presented as *the* theory of Coincident Entities (the *only* version of it): this is what happens for instance in Michael Rea's presentation, who directly equates the "Coincident Entities solution" and the rejection of Mereological Extensionality (see also in Olson 2006 Olson's classification of the solutions specifically to the Amputation Paradox, and the "way of coincidence" in section 10). This simplification is unfortunate, because it bypasses the discussion of the comparative merits of the other version of the Coincident Entities solution, namely the Unique Part View. In this paper, I will not offer an evaluation of the comparative merits of the Constitution View and the Unique Part View *across the board* (i.e. for *all* possible scenarios to which the Constitution View has been applied). I will only evaluate their comparative merits *as solutions to the specific Paradox of Amputation* (or of Disembodiment).

3 The unique part view (Coincident Entities without Supplementation)

The second version of the theory of Coincident Entities appears *mostly* in the discussion of the Problem of Disembodiment (Stump 2006; Hershenov and Koch-Hershenov 2006; Oderberg 2012; Guillon 2017), and much more rarely in the context of the Amputation Paradox (though see Lowe 2013), or *a fortiori* in the context of the problem of the Statue and the Clay. So I will first show how the solution applies to the Problem of Disembodiment, and then extend it to the Amputation Paradox (but *not* to the problem of the Statue and the Clay).

Suppose that living human beings are compounds of body and soul, and that souls are immortal (they survive bodily death). Then when Sally dies, Sally's Body and Sally's Soul are separated but Sally's Soul continues its existence as a disembodied soul.[9] What about Sally herself? There are two options here: either we say that the persistence of Sally's Soul is (somehow) sufficient to ensure that Sally herself also continues to exist—this solution is called "Survivalism"—or we say that, Sally's Soul being something else than Sally herself, it is *only* Soul that survives but *not* Sally herself—this view usually goes under the name "Corruptionism".[10] In our classification, Corruptionism is a kind of eliminativist solution: it avoids any problematic question about the relation between Sally and Soul by denying the existence of one of them (after disembodiment). The Problem of Disembodiment properly speaking arises only for Survivalists.

If both Sally and Soul continue to exist after disembodiment, what is the relation between them at that time? If you say they are *identical*, then you have to say either that they were identical before disembodiment (contrary to our hypothesis that Sally before disembodiment was a *compound* of Soul and Body), or that identity is a contingent relation (which, as we have seen, is a suspicious fiddling with the logic of identity). Therefore, most Survivalists defend that Sally and Soul remain numerically distinct though "coincident"—of course the notion of "coincidence" here is not spatial, but captures the idea that Sally is "reduced to" her Soul, though she remains distinct from it.

So far, we only have the general features of a "Coincident Entities solution". We haven't a particular *version* of the solution. In order to get to a particular version, we have to say more about the relation between the two coincident things. And what

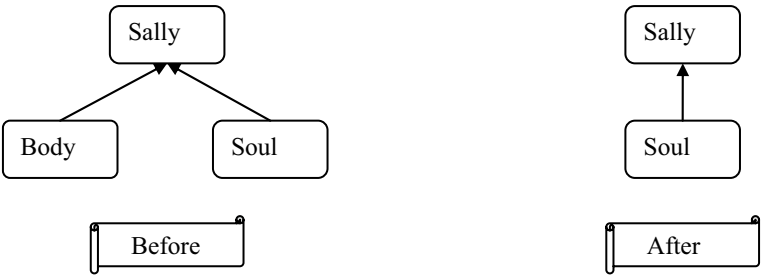
[9] We will not discuss here the question whether Sally's Body also continues to exist (as a corpse) or whether it ceases to exist altogether (the corpse being a thing numerically distinct from Sally's Body). Orthodox Thomists are adamant that the latter is what happens, but it will play no role in our discussion.

[10] For historical reasons, Survivalism and Corruptionism are mostly discussed, in the contemporary literature, by people who either are historians of Aquinas' thought, or are Thomists themselves. For that reason, most papers on Survivalism and Corruptionism will include a substantial part discussing the question whether Aquinas himself was a Survivalist or a Corruptionist. See especially (Stump 2006; Toner 2009; Oderberg 2012). For that reason, philosophers are sometimes called "Corruptionists" (Toner, Pasnau) because they defend the view *that Aquinas* was a Corruptionist, but not because they defend Corruptionism themselves (and similarly for Survivalists). This is not how we will use the terms here: I will sidestep completely the historical question of what Aquinas thought, which has no bearing on the present discussion.

is interesting is that when people start with the Problem of Disembodiment as the relevant case of coincidence (instead of starting with the problem of the Statue and the Clay), they typically arrive at a *different* characterization of the relation between coincident things.

Here is how they reason: before disembodiment, Sally is "made of" Soul and Body (she has two parts); at the moment of death, one of these things she's made of is suppressed (Body), but she is still "made of" what is left; in other words, she is still "made of" Soul—in fact, she becomes "made of" Soul *alone*. She has lost the relation she had towards Body, but she hasn't lost the relation she had towards Soul. Therefore, Soul remains a *part* of Sally, even though it becomes the *only* part of Sally. The relation between Sally and Soul after disembodiment is not some relation of "constitution" which holds between two things that have "all their parts in common"; for one thing, it is doubtful whether Soul has parts in the first place; and even if it *did* have parts, it wouldn't have exactly the same proper parts as Sally has, since Sally has *Soul* as proper part, while of course Soul doesn't have itself as *proper* part; finally, the relation between Sally and Soul is not a *sui generis* relation that we have to posit besides the mereological notion of parthood: it is just the mundane relation of parthood—the very same relation that they had before disembodiment.

The following picture sums up what happens in this scenario:



In this version of the Coincident Entities solution, the two distinct entities that coincide (Sally and Soul), coincide in the sense that one is the only (proper) part of the other, without a "remainder" or a "supplement". This idea, that a thing could have a unique proper part without supplement, directly violates a principle of CEM, namely the Weak Supplementation Principle (WSP):

$$\mathrm{PP}xy \rightarrow \exists z(\mathrm{PP}zy \wedge \neg \mathrm{O}zx)$$

If x is a proper part of y, then there is a z which is a also a proper part of y and is disjoint from x.

Most mereologists accept the axiom of Weak Supplementation, and some mereologists, for instance Peter Simons, consider it to be an analytic truth, constitutive of

the very meaning of "part".[11] These mereologists typically ask what it could possibly *mean* to say that the soul is *part* of the person once there is no other part left, and some readers may share this semantic worry. We will come later to the question whether it is possible to defensibly and *meaningfully* reject WSP. For now, what is important is to notice that the Unique Part View is characterized by the rejection of this principle (WSP), just like the Constitution View is characterized by the rejection of the axiom of Extensionality (EXT)—which is another important principle of CEM. Note that the Constitution View does *not* reject WSP (in the Constitution View, the constituting thing is not a part of the constituted thing; they share all the same parts, but none of them has a unique part without supplement). And note also that the Unique Part View does *not* reject EXT (in the Unique Part View, the coinciding things do *not* have all their proper parts in common: as noted above, Sally has a proper part which Soul doesn't have, namely Soul itself; so EXT is not violated).

Now, some philosophers seem to think that the materialist scenario commits one to a rejection of EXT while the disembodiment scenario commits one to a rejection of WSP. For instance, Hershenov and Koch-Hershenov write the following in their discussion of disembodiment:

> It would also mean that the human being has then [after disembodiment] only a single proper part, a soul. It is a standard mereological notion that something can't have a single proper part. But we have a good reason to give up mereological assumptions here, just as the materialist who believes in spatially coincident objects must give up the position that two things are identical if they have all the same proper parts. (Hershenov and Koch-Hershenov 2006, p. 445)

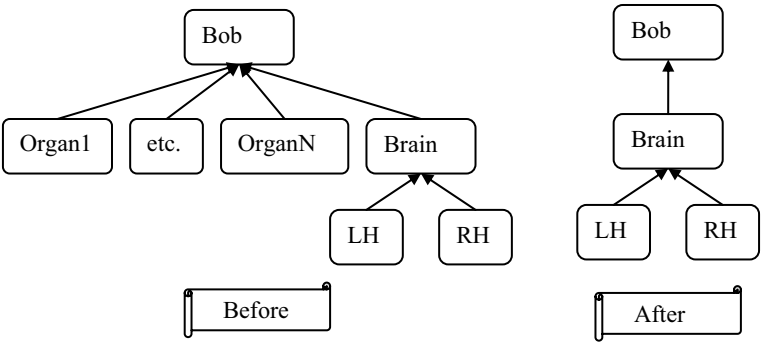
This would mean that the Unique Part View is a version of Coincident Entities Theory necessarily linked with the dualist Problem of Disembodiment, while the materialist Amputation Paradox would necessarily lend itself to the Constitution View (violating EXT). I think this is a mistake: both versions of Coincident Entities Theory can be applied to both scenarios, and as far as I can see, there are only accidental reasons (and no deep and substantial reasons) for the fact that, in the contemporary literature, the dualist scenario is usually associated with the Unique Part View, and the materialist scenario with the Constitution View. Achille Varzi, for instance, just after mentioning the disembodiment scenario, notes that the violation of WSP that it contains should also happen in the materialist problem of Amputation:

> Indeed, any case of material coincidence resulting from mereological diminution, as in the Stoic puzzle of Deon and Theon and its modern variant of Tibbles and Tib, would seem to be at odds with Supplementation: after the diminution, there is nothing that makes up for the difference between what was a proper part and the whole with which it comes to coincide. (Varzi 2016 ibidem)

[11] "In cases of putative counter-examples where a disjoint supplement is lacking, we are more inclined to deny that the one object is a proper part of the other at all. That would suggest that WSP is indeed analytic—constitutive of the meaning of 'proper part'." (Simons 1987, p. 116).

Actually, Oderberg and Hershenov, who arrived at the rejection of WSP from the consideration of the disembodiment scenario, also note that it could be extended to amputation scenarios.[12] E.J. Lowe (Lowe 2013, p. 136) also indicated his preference for the Unique Part View in response to the traditional Amputation Paradox.

In any case, here is how the Unique Part solution can be applied to the Amputation Paradox. The gist of the solution is to say that Brain, which before amputation was a proper part of Bob *alongside Organ1,* etc.*, OrganN*, remains a proper part of Bob after amputation, but the *only* proper part of Bob (of course, the proper parts of Brain also remain, transitively, proper parts of Bob; so strictly speaking, Brain is not the *only* proper part of Bob, but it is a proper part without a disjoint supplement, which is what violates WSP). The following picture represents this scenario:



An anonymous referee suggested to me that the two scenarios (disembodiment and amputation) have something in common which renders the Unique Part description intelligible and even plausible. The common feature is that Sally's Soul and Bob's Brain, even before disembodiment or amputation, seem to be very *peculiar* parts of Sally and Bob; namely, they are (in Aristotle's parlance) "controlling parts" or "ruling parts" (see Aristotle 2014, p. 1168b). As the reviewer rightly notes, "given our tendency to identify a composite with its 'controlling' or 'ruling' part, we are apt to allow that the composite can persist with only this part (and its parts) and no supplement". In any case, such is the model; we will turn to arguments properly speaking in the next sections.

To summarize, at this point we have seen two versions of the Coincident Entities solution: each one of these versions violates a principle of CEM, but they don't violate the *same* principle. The Constitution View violates the axiom of Extensionality (EXT), while the Unique Part View violates the principle of supplementation (WSP). We have also seen that both versions could be applied to the materialist scenario as well as to the dualist scenario, even though in the present literature there is some tendency to associate the Constitution View with the materialist problem,

[12] (Oderberg 2005, p. 97) mentions the reduction of a human body to its head, and (Hershenov and Koch-Hershenov 2006, p. 445) reuse Eli Hirsch's example of a tree reduced to its trunk.

and the Unique Part View with the dualist problem. But I cannot see any principled reason for such an association. For that reason, the dualist problem (whatever one thinks of the plausibility of dualism per se) can have a useful heuristic role in drawing our attention to a possible solution that tends to be forgotten in the mainstream discussion of the Amputation Paradox. As a matter of fact, I will now argue that the Unique Part View should be preferred over the Constitution View in both the dualist problem of disembodiment and the materialist Amputation Paradox. (But I will *not* argue that the Unique Part View should also be preferred over the Constitution View in the problem of the Statue and the Clay. For all I will argue here, it might be that *this* other problem requires to appeal to the Constitution View. That's why I am not arguing against the Constitution View per se.)

4 The intrinsicality argument against the constitution view as a solution to the amputation paradox

Now that we have in mind the two theories of Coincident Entities, it is time to try and adjudicate which one is the best (or most satisfactory) solution to the Amputation Paradox (or to the Paradox of Disembodiment).

In making their choice, it seems that many philosophers in the last decades have been much influenced by Classical Extensional Mereology (CEM) and its principles. One way to make a choice is to reason as follows: the Constitution View violates EXT, the Unique Part View violates WSP, therefore (if we want to adopt a Coincident Entities solution) we are bound to abandon *some* principle of CEM. Given this dilemma many will come back to the Logician to tell them which principle (EXT or WSP) is the cheapest to abandon. Here, the typical mereologist will tell them that from a logical point of view WSP is on much firmer ground than EXT—indeed, that it is "analytic, constitutive of the meaning of 'proper part'", as says Peter Simons.[13] For that reason, our philosophers will choose the Constitution View, which abandons EXT and preserves WSP. Hence the adoption of the Constitution View as a solution to the Amputation Paradox.

Now, if WSP *were* an analytic principle, that would surely be a reason not to adopt the Unique Part View. We will discuss in the next section whether WSP is analytic or not. For now, I will mention the fact that, in my view, we shouldn't be too much impressed by the fact that such and such a principle is an axiom of CEM, or by "arguments from logical elegance" in general: a mereology with EXT or with WSP is surely more "elegant" than a mereology without these principles; but that is not in the least a reason to believe that such mereologies are more probably *true* descriptions of what is a part of what in reality. After all, one of the most elegant axioms of CEM is the axiom of Unrestricted Sum, according to which *any* two things always compose a third one which has the first two as parts. Unrestricted composition is very elegant, but that doesn't make it probably *true* (as a metaphysical description of real composite objects). By the same token, EXT and WSP should be evaluated not

[13] Cf. footnote 11.

in terms of their elegance, but with respect to their ability to account for the data of reality. This is how we will evaluate them now.

I will start with an objection against the Constitution View (as a solution to the Amputation Paradox).

My main argument against the Constitution View (as a solution to the Amputation Paradox) will be the "Intrinsicality Argument", but it is helpful (heuristically speaking) to start the discussion with a weaker argument which will set the stage for the Intrinsicality Argument.

The introductory argument will be called the "lost part argument". This argument is directly linked with our focus on Amputation scenarios or Disembodiment scenarios (it does *not* apply to scenarios such as the Statue and the Clay). As I said before, defenders of the Constitution View typically start motivating their view on the paradigmatic case of the Statue and the Clay, and then apply it to the Amputation scenario. But there are important differences between the two scenarios, differences that render the Constitution View much less appealing when we focus on the scenario of Amputation. One fundamental difference is this: in the scenario of the Statue and the Clay, there is no time at which the clay Lumpl is obviously a proper part of the statue Goliath.[14] Things are different in the Amputation scenario: in the Amputation scenario, it is an obvious datum of common sense and a widely shared basic intuition that Brain is a proper part of Bob *before* Amputation. But then, given that Brain is a proper part of Bob before Amputation, the Constitution theorist[15] has to say that Brain *ceases* to be part of Bob at the moment of Amputation. So it seems that the Constitution theorist has to say something like the following:

> During the Amputation process, not only does Bob lose his part "left arm" and his part "heart", etc. he *also* loses his part "Brain"; Brain is no longer a part of Bob after the Amputation.

But this is extremely weird: Brain is precisely *the* part that Bob *doesn't* lose during the process of Amputation. As an anonymous reviewer suggests, "we could imagine a friend of Bob, standing by sympathetically, thinking, 'Well, poor Bob still has his brain.'".

Such is, in a preliminary formulation, the "lost part argument". This argument reminds us that the difficulty in giving an account of the Amputation scenario lies not only in giving a plausible description of the last stage of the scenario (the stage where two things coincide): the difficulty lies also, and perhaps more

[14] Perhaps one might try to *argue* for the view that Lumpl is sometimes a proper part of Goliath (see e.g. Koslicki 2008, pp. 180–81), but whether or not there are good arguments for that view, this is certainly not an obvious truth of common sense nor a widely shared basic intuition in the case of the statue and the clay.

[15] From now on, I will use the phrase "the Constitution Theorist" to mean "the Constitution Theorist *of the Amputation Paradox*". This is the person I will be arguing against. I will *not* be arguing against a Constitution Theorist who applies the Constitution View *only* to cases such as the Statue and the Clay, and doesn't apply it to the Amputation Paradox. I have no objection against someone who would be a Unique Part Theorist *for the Amputation Paradox* and a Constitution Theorist *for some other cases*. That's why I am not arguing against "the Constitution Theorist" absolutely or strictly speaking.

importantly, in giving a plausible description of the *transition* from one stage to the other. That is where the Constitution View seems to me to be very week. The Constitution View has to say that, in the transition (the Amputation), Bob *loses* his Brain-part, but this is not at all what we would want to say about the transition.

Against this simple argument, the Constitution Theorist will probably respond something like the following:

> Saying that (in my description of the scenario) Bob *loses* his Brain-part is a confusing way of speaking: it is true that Brain ceases to be a part of Bob, since it becomes "that which constitutes Bob". But there is no sense in which Bob *loses* his Brain. In my scenario, Bob *retains* his Brain; he *continues to have* his Brain after the amputation, although he now has it *as that which constitutes him*; but it makes no sense to say that he "loses" it as a part, even though it ceases to have it as a part. It would be somewhat like saying that if I had a rented house and then later on came to buy and own it, I would thereby "lose" my house because I would lose it as a rental. But of course in this scenario I wouldn't "lose" my house in any sense, even though my house would cease to be a rental. Just like there are two ways for my house to cease to be my rental (either because I come to be the owner of the house, or because I cease to have the house altogether), similarly there are two ways for something to cease to be a part of something else: either by becoming that which constitutes the other thing (that's the case for Brain), or by being "lost" (that's what happens to Organ1, etc., OrganN). In the former case, the thing that ceases to be part is not "lost" in any relevant sense.

This response does address the initial wording of the "lost part argument", but it seems to me that it doesn't go to the heart of the problem. In this response, the Constitution theorist manages to avoid saying that Bob "loses" his Brain-part, but he maintains that Brain ceases to stand in the Parthood relation to Bob. But the heart of the problem is this: *is there* any fundamental relation between Bob and Brain that they cease to stand in? In a fundamental sense, it seems that Organ1, etc., OrganN lose a fundamental relation which they had towards Bob, but that Brain *preserves* all interesting and fundamental relations that it had towards Bob. In order to make this objection more carefully, we will have to use the notion of an "intrinsic relation". This will give us the "Intrinsicality Argument".

Let us first remind what an intrinsic relation is. Here is the traditional definition:

> An n-place intrinsic relation is an n-place relation that n things stand in in virtue of how they are and how they are related to each other, as opposed to how they are related to things outside of them and how things outside of them are; whereas, this is not the case for extrinsic n-place relations. (Weatherson and Marshall 2018, Sect. 1.3)

For instance the relation "is a lover of" is a 2-place intrinsic relation which holds between Romeo and Juliet only in virtue of how they are and how they are related to

each other. On the other hand, the relations "is the only lover of" and "is one among other lovers of" are extrinsic relations. The former would hold between Romeo and Juliet in virtue not only of the fact that they stand in the intrinsic relation "is a lover of", but *also* in virtue of the fact that things outside of them do not stand towards Juliet in the relation "is a lover of". And of course, the latter ("is one among other lovers of") would hold between Romeo and Juliet in the opposite case, i.e. in virtue of other people outside Romeo and Juliet standing towards Juliet in the relation "is a lover of". It is important to notice in this example that the extrinsic relation between Romeo and Juliet is partly grounded in the properties and relations of other things *but also partly grounded* in an intrinsic relation between Romeo and Juliet. It is possible in theory to invent limit cases of extrinsic relations that are *solely* grounded in the properties or relations of things outside of the relata: for instance, the relation "_ and _ are both such that the earth orbits the sun" is a relation in which Romeo and Juliet (and every other pair) stand solely in virtue of the earth's orbiting the sun. But this is a limit case. Typically, extrinsic relations between two things are partly grounded in some intrinsic relation in which the two relata stand.

Given this definition, the Intrinsicality Argument can be formulated in a nutshell as follows:

1. There is an intrinsic relation between Brain and Bob that is not lost during the Amputation process.
2. Parthood is precisely this intrinsic relation.
3. Therefore, Brain doesn't cease to be part of Bob in the Amputation process.

Here is how we can arrive at this argument. For comparison, think about a scenario in which Juliet has two lovers, Romeo and Tebaldeo at t1, and at time t2 Tebaldeo gets killed. Does the relation between Romeo and Juliet change in the transition? Well, in a sense yes: Romeo and Juliet used to stand in the relation "is one among other lovers of", and they don't stand anymore in this relation. But this seems to be a mere "Cambridge change": this relation that Romeo and Juliet have lost ("is one among other lovers of") is a purely extrinsic relation, and the *intrinsic* relation between Romeo and Juliet has *not* been lost. According to the defender of the Intrinsicality Argument, the situation of the Amputation scenario is similar. Of course, it is always possible to say that "some" relation between Bob and Brain changes (or is lost) when Bob loses his Organ1, etc., OrganN as parts. But this seems to be a mere extrinsic change: it is something that happens not to Bob and Brain properly or intrinsically speaking, but rather happens to Bob and Brain *in virtue of* happening to Bob and something else (Organ1, etc., OrganN). In this change, it doesn't seem that anything happens to the intrinsic relation between Bob and Brain. Or, speaking more carefully (for there might be many intrinsic relations between Bob and Brain), it seems obvious that there is some intrinsic relation between Bob and Brain that remains unaffected by that change. No Constitution theorist, as far as I

am aware, has (as yet) taken this relation into account:[16] the standard Constitution theorist says that Brain and Bob used to stand in the parthood relation, and that they now stand in the Constitution relation, but she doesn't have any name for the relation in which they *continue* to stand. But it seems obvious that there is such an intrinsic relation in which they continue to stand (in spite of what happens to other things, namely Organ1, etc., OrganN). This is premise 1. Premise 2 adds that once we have acknowledged the existence of this intrinsic relation that persists between Bob and Brain, it is hard to deny that Parthood is precisely the name of that very relation (or at least of one such relation, if there are several intrinsic relations between Bob and Brain that persist during the Amputation process).

It follows that parthood is a relation that continues to hold between Bob and Brain during the Amputation process, i.e. that Brain continues to be a *part* of Bob, even at a time when Bob doesn't have any supplementary part than Brain.

How would the Constitution Theorist respond to this argument? I suspect she will want to raise doubts about premise 2, and not about premise 1. In other words, she will probably grant that there is some intrinsic relation that continues to hold between Bob and Brain but she will insist that this relation is not the relation of Parthood (nor, of course, the relation of Constitution). Parthood, she might argue, is precisely the name of the relation that *does* change. (In the scenario of Romeo and Juliet, it is comparable to the relation "is one among other lovers of".)

Now, if she grants that there is some intrinsic relation in which Bob and Brain continue to stand, I will want to ask: what *is* this intrinsic relation? I suppose her response would have to be something like this: when Organ1, etc., OrganN and Brain are still parts of Bob, all of them are "what Bob is made of" but each one in a partial way. In other words, each one of them is (towards Bob) a "what-it's-made-of", but they also have the relation of being "one among other what-it's-made-of-s". If we accept this intuitive description, the relation "is a part of" could be *defined* as being the relation "is *one among other* what-it's-made-of-s". And *this* relation is grounded in the intrinsic relation "is *a* what-it's-made-of". (Compare: the relation "is one among other lovers of" is grounded in the intrinsic relation "is a lover of".)[17]

If *that* is what the Constitution Theorist wants to say, then I would have three remarks to make. First, I would make the preliminary and methodological remark that it would be helpful to have a name for this fundamental and intrinsic relation that lies at the heart of parthood (once we all agree on its existence). In other words, I would just ask my interlocutor "how do you want to call this relation", so that we can be clear on terminology. Let us say that the Constitution theorist would call

[16] Even though, as an anonymous reviewer rightly points out, the Constitution Theorist *could* in principle acknowledge the existence of this remaining intrinsic relation, since the existence of such a relation is perfectly *consistent* with the Constitution Theory. We will see in the next paragraphs what would happen if the Constitution Theorist explicitly takes into account this relation.

[17] I will come back later on the difficult question whether the parthood relation so understood is an extrinsic relation or an intrinsic relation. What is important in the present argument is *only* the fact that (i) the other relation, "is *a* what-it's-made-of", is clearly an intrinsic relation, (ii) it is an intrinsic relation that Bob and Brain don't lose during the Amputation process, and (iii) the parthood relation, be it extrinsic or intrinsic, is grounded in this relation.

it "being a what-it's-made-of" (as in the above paragraph). Second, I would argue that the intrinsic relation which the Constitution Theorist now accepts to call "being a what-it's-made-of" is *precisely* what I want to call "being a part". To a certain extent, this would mean that we have arrived at a merely verbal disagreement, where she wants to use the word "part" for some relation ("being one among other what-it's-made-of-s"), and I want to use it for another (intrinsic) relation that grounds it ("being a what-it's-made-of"). But, even though there is freedom in definitions, it also seems to be a better (or more natural) terminological practice to use a common and fundamental word like "part" to designate the intrinsic relation rather than the extrinsic relation that is grounded in it.

My third remark is more important and constitutes a direct objection. So far, I have only presented what the Constitution Theorist could say about the first stage of the Amputation scenario (i.e. before Amputation). But what would she say about the transition to the second stage (i.e. about the Amputation process itself)? Obviously, she would say that Brain and Bob don't cease to stand in the intrinsic relation "is a what-it's-made-of", but that they cease to stand in the relation "is one among other what-it's-made-of-s" (which just *is* the parthood relation, according to her). It follows logically that Bob and Brain would start to stand in a *new* relation, namely "is *the only* what-it's-made-of". Notice that this relation is also partly grounded in the intrinsic relation "is a what-it's-made-of". Consequently, it is *not* a fundamental relation. (I am using here the words *fundamental* and *derivative* in the sense in which they are used in the contexts of discussion of the theory of metaphysical grounding: if an entity x is grounded in an entity y, we say that x is derivative—and if y is derivative as well, then we can say that x is *more* derivative than y. If on the other hand, x is grounded in no entity at all, then x is absolutely fundamental—but we can also say, more loosely, that x is *more* fundamental than y when y is grounded in x, even when x is not absolutely fundamental). Now my question is: what is the relation between this new relation ("is *the only* what-it's-made-of") and the relation of Constitution which is pivotal to the Constitution View? Both are relations that Brain and Bob *acquire* at the time of Amputation; both entail the relation "is a what-it's-made-of"; in fact, I don't see how the Constitution Theorist could resist saying that the relation "is *the only* what-it's-made-of" just *is* the relation of Constitution. But if she says this, then she has to accept that the Constitution relation is *not a fundamental relation*, since it is grounded in the more fundamental relation "is *a* what-it's-made-of". This is an objection at the very least against mainstream Constitution Theory who wants to hold that the Constitution relation is a *fundamental* relation.

If, on the other hand, the Constitution Theorist is happy to grant that the Constitution relation is not a fundamental relation, but is grounded in the more fundamental (intrinsic) relation "is a what-it's-made-of", then it seems to me that the dispute between the Constitution Theorist and the Unique Part View becomes a purely verbal dispute, a pure matter of vocabulary that can be solved by the following table of translations:

(Neutral lingo)	Constitution lingo	Unique Part lingo
x is a what-it's-made-of of y	(?)	x is a part of y
x is one among other what-it's-made-of-s of y	x is a part of y	x is one among other parts of y
x is the only what-it's-made-of of y	x constitutes y	x is the only part of y

As I've said, even though we have complete freedom in definitions, it seems to be a better practice to use the common word "part" for a relation which is more fundamental. Furthermore, this table shows that the Unique Part lingo is (strictly) more expressive than the Constitution lingo. But there are other considerations that might come into play when choosing a terminology. One of them has to do with natural language and the analytic intuitions we have about the words of natural language. Since "part" is clearly a word of natural language, it is completely legitimate to enquire about our analytic intuitions about it; and as we will see in the next section, these analytic intuitions constitute the main objection against the Unique Part view (or the Unique Part lingo).

5 The analyticity objection against the unique part view (and response)

What seems to be the strongest argument against the Unique Part View is the intuition that "WSP is indeed analytic—constitutive of the meaning of 'proper part'." (Simons 1987, p. 116). I will call this objection "the Analyticity Objection", and in this section I will argue that it is unsuccessful. More precisely, I will argue that when we keep in mind both the analyticity objection and the intrinsicality argument of the previous section, we are confronted with an *ambiguity* between two concepts of parthood, and that the best way out of this ambiguity is to use the word "part" for the concept that does not verify WSP.

The best way to present the "analyticity objection" is probably to start with sentences that contain words derived from "part", like "partial" or "partially". When we say that a certain sphere is "only partially red", for instance, it does seem to entail analytically that it is not red overall, i.e. that part of it is red *and* part of it *isn't* red. It lies in the very meaning of the word "partial" that what is (only) partial is not complete. Generally, when x is (only) partially F, this seems to entail that there is a part of x that is not F, i.e. that there is a *supplement* in x to the part that is F (a supplement that is not F). With the word "part" itself used as a "mass term" (as (Baker 2000, p. 182) has noticed that it can), the same semantic intuition seems also strong: if "(only) part of the sphere" is red, then it seems to follow that "part of the sphere" isn't. It is perhaps somewhat less clear that when "part" is used as a "count noun", "x is *a* part of y" analytically entails that there is another thing that is *a* part of y. But the other semantic remarks would seem to show that the linguistic stem "part"

in general, and the words derived from it, do contain analytically the notion of a supplement.[18]

There is no doubt that this objection is a strong one. It *does* reveal that there is a tendency or an inclination to use the linguistic stem "part" in a sense that analytically entails WSP. But this consideration should be put in balance with the following.

First, it is important to remark that if the notion of "a part" analytically contains the truth of WSP, then it directly follows that the relation of parthood is *not* the intrinsic relation that Bob and Brain retain in the Amputation process, namely the relation "is a what-it's-made-of". And as we have seen in the preceding section, there is a strong inclination to take the word "part" as designating precisely this intrinsic relation. So the dialectical situation here seems to be a direct conflict between two analytic intuitions—and *not* a situation where there is an analytic intuition in one direction alone (that of the analyticity of WSP).

One might be tempted to go further and say that if "part" analytically contains the truth of WSP, then it follows that the relation of parthood is an *extrinsic* relation. After all, if it is part of the meaning of part that "x is a part of y" *only if* "there is some z outside of x that is a part of y", it directly follows that two things x and y can stand in the relation "is a part of" only in virtue of how they are related to things "outside" of them—which is the definition of an extrinsic relation. But things are more complicated here, since the third "thing" z (the supplementary part) to which the whole y must be related in order for x to be a *part* of y is not wholly outside of y since it is a *part* of y. Therefore, even if "parthood" were the relation of "being one among other what-it's-made-of-s", it would still be an *intrinsic* relation in the commonly accepted sense.[19] This is why I was careful, in the previous section, not to say that the relation "is one among other what-it's-made-of-s" was an extrinsic relation.

Nevertheless, there does seem to be some weaker sense in which this relation is "extrinsic", even though it is intrinsic in the classical sense. A comparison will be helpful here. Consider Queen Elizabeth's right eye: her right eye (RE) has two

[18] As an anonymous reviewer rightly points out, an other classical way to convey the analytic intuition of WSP is the slogan "the whole is greater than the part". But this slogan, if we regard it not as a mere *expression* of the intuition of WSP, but as a formulation that helps seeing why it seems to be analytic, seems to me to have two defects, as compared with my formulation of the rationale of the analyticity intuition. One problem is that the slogan uses the word "greater" which seems to be adequate (or at least literally adequate) only for parts and wholes that are situated in space. Therefore it doesn't seem to capture adequately the generality of the intuition (which should apply also to non material, non spatial, parts and wholes). Second, and more importantly, the slogan involves not only the notion of "part" but also the notion of "whole". Now, let us grant that it seems to be analytically contained *in the notion of a whole* that a whole must be made of more than one parts. But is it contained *in the notion of part* that that which has a part must have more than one parts? That is much less clear, and that is what we want to determine here. It *might* be that the notion of a whole is not equivalent to the notion of "that which has a part". Perhaps is it the case that, among the things that have part(s), (we can conceive that) some are wholes (those which have several parts) and others are *not* wholes (but only things with a unique part). In any case, what I say later about the weighing of opposite analytic intuitions would also apply to this analytic intuition.

[19] I.e. A relation that would still hold between the perfect duplicates of the relata, since the duplicate of the whole must have *all* the same parts.

interesting relations to Queen Elizabeth (QE), namely the relation "is an eye of" and the relation "is one among other eyes of". RE has the *latter* of these relations to QE ("is one among other eyes of") in virtue of two facts: the fact that it has the *former* relation to QE, and the fact that something other (QE's left eye) *also* has this relation to QE. The first of these facts supervenes on some proper part of Queen Elizabeth (let's say her right orbit and what it contains), and the second of these facts supervenes on some *disjoint* proper part of Queen Elizabeth (let's say her left orbit and what it contains). In other words, the fact that RE has the relation "is one among other eyes of" to QE is partly grounded in a relation (between QE and left eye) which is not (admittedly) "wholly outside" of QE (and for that reason it is *not* an "extrinsic" relation) but which is wholly outside the proper part of QE that is relevant to RE's having the intrinsic relation "is an eye of" to QE. More simply, the "intrinsic" relation "is one among other eyes of" between RE and QE is partly grounded in a relation of QE with something which is wholly outside the proper locus of the relation of RE and QE. That's what gives us the intuition that it is still extrinsic in some weaker sense. Let us call this sense "weakly extrinsic".

Another example of a weakly extrinsic property would be the following: [Peter] is shaking one of [Paul]'s two hands". The proper locus of this relation between Peter and Paul is Paul's hand that is being shaken (let's say the right hand). If during the shaking Paul loses his left hand (due to an explosion, for instance), Peter and Paul will lose this relation but they will not lose the relation "x is shaking y's right hand" on which it is grounded. In that sense, the "relation" they will be losing seems to be just as much a Cambridge relation as the relation "is one among other lovers of" when it's lost by Tebaldeo's death. (Of course, Paul will lose a *property* that is *not* a Cambridge change: he will lose a hand; the point here is only that the *relation* between Peter and Paul changes only in a Cambridge way—because it changes in a part of Paul that has nothing to do with his relation to Peter.)

Now that we have the notion of a "weakly extrinsic" relation, can we make a stronger argument against WSP? I don't think so. One might be tempted to argue as follows: First, if parthood verified WSP it would directly follow that parthood is a weakly extrinsic relation; second, we have an intuition that the relation of parthood is *not* weakly extrinsic (Let us call "strongly intrinsic" an intrinsic relation that is not weakly extrinsic: roughly speaking, a strongly intrinsic relation between x and y is such that it is not grounded in any property or relation involving any object wholly distinct of the *parts* of x and y that are relevant to their being related). The problem with this argument is the second premise: given the way in which weak extrinsicality (or strong intrinsicality) are defined, saying that we have the intuition that parthood is not weakly extrinsic (or is strongly intrinsic) is saying nothing more than that we have the immediate intuition that WSP is false. Therefore, this second premise is quite clearly question begging.

Therefore, the only non-question-begging argument against WSP is the one I gave earlier, namely the one that starts with the intuition that *there is* some important intrinsic relation between Bob and Brain that is preserved during the Amputation process—namely the relation of "being a what-it's-made-of". And secondly, once

we have clearly identified this relation, it is highly intuitive (in terms of semantic intuitions) to say that this relation is precisely what we mean with the word "part"

This argument is not begging the question against the defender of WSP. And if it is correct, what it shows is that we have two conflicting semantic intuitions about the word "part": one according to which "part" designates the (strongly) intrinsic relation "is a what-it's-made-of", and one according to which it is the (weakly extrinsic) relation "is one among other what-it's-made-of-s". So the dialectical situation here seems to be a direct conflict between two analytic intuitions—and *not* a situation where there is an analytic intuition in one direction alone (that of the analyticity of WSP). The difficulty, then, will be to solve this conflict of analytic intuitions, and I will argue that it should be resolved in the direction that does *not* validate WSP.

Second, if we want to solve the conflict of intuitions—between the WSP intuition and the intuition of the preserved intrinsic relation—it will be helpful to remember, as we saw in the previous section, that *if* the relation of parthood *were* the relation "is one among other what-it's-made-of", it would be *grounded* in the relation "is *a* what-it's-made-of". In that case, the conflict of intuitions would amount to the following: in using the word "part", there is a tendency to use it to mean the *derivative* relation "is one among other what-it's-made-of-s", but there is *also* a tendency to use it to mean the more fundamental relation "is a what-it's-made-of". There are two meanings available here, meaning (i) and meaning (ii), and our intuitions would be such that we are sometimes inclined to use the word "part" with meaning (i), and sometimes with meaning (ii). If *that* is what happens, then it seems that we are just confronted with a case of ambiguity of natural language, and the solution would seem to be to regiment natural language by making a distinction between the two meanings of the word: part-1 and part-2. Correlatively, one could explore independently the logics associated with these two different concepts (and their corresponding principles): there would be a mereology-1 for concept part-1 (a mereology which would verify WSP) and a mereology-2 for concept part-2 (which would *not* verify WSP).

Thirdly and finally, if the conflict between the WSP intuition and the intuition of the preserved intrinsic relation boils down to a mere ambiguity, and a need for regimentation of our technical language, then it seems to me that the following considerations should be followed in choosing our new (regimented) terminology: when we are doing metaphysics, it seems more convenient to use words that are common and apparently undefinable to mean properties or relations that are (more) fundamental, and conversely to use defined or complex expressions to mean properties or relations that are (more) derivative. Following this principle, when we have to give names to the fundamental relation "is a what-it's-made-of" and to the derivative relation "is one among other what-it's-made-of-s", it seems only natural to use the common word "part" to mean the former, and then to *define* the latter with the use of the former, in the following way: "is one among other parts". Such is, therefore, the terminology which we should use: we should use the word "part" for the fundamental relation that does *not* verify WSP (and which is preserved in the Amputation scenario), and then have a defined notion of "being one among other parts" to do whatever job needs to be done to capture the analytic intuition of WSP. If we use words

in that way, then mereology properly speaking (the logic of the concept meant by the word "part") would not validate WSP, despite the initial force of the WSP intuition.

I conclude that the strongest objection against the Unique Part View (namely the analyticity objection) is not conclusive when it is put in balance with the intuition that some intrinsic relation is preserved in the Amputation process. Therefore, the Unique Part View has a strong advantage over its competitor, the Constitution View, in accounting for the Amputation Paradox.

Before I turn to the conclusion, I should address here another objection to the Unique Part interpretation of the Amputation Paradox.[20] One thing that theories of Coincident Entities typically want to account for is the apparent *asymmetry* of the relation between the two coinciding objects. Typically, the Constitution Theorist *doesn't want* to account for this asymmetry in terms of the asymmetry of the proper parthood relation (since, typically, when x constitutes y, x is not a part of y). What about the Unique Part Theorist? How can he account for the asymmetry of the relation between Bob and Brain? The beginning of the answer seems obvious: the Unique Part Theorist will want to say that the asymmetry of the relation between (coinciding) Bob and Brain *just is* the asymmetry of the parthood relation, which is commonly accepted by all mereologists. But here comes a difficulty: perhaps the consensual asymmetry of the parthood relation *rests on* the (also consensual) principle of WSP! Why should that be so? Well, because when we accept that "the whole is greater than the part", we seem to see clearly (somewhat metaphorically speaking) that the part can "fit in" the whole, but not the whole within the part (since it is "greater" and therefore "too big" to fit in). But if the part and the whole are *coincident*, why couldn't the whole "fit in" the part at the same time that the part "fits in" the whole? In other words? Why couldn't Bob be the only (proper) part of Brain at the same time that Brain is the only (proper) part of Bob? (Granted, most things will not be parts of each other, but why couldn't it be that in these exceptional cases of coincidence two things can be parts of each other?) What *reasons* do we have to say that parthood must remain asymmetric when we have abandoned WSP?

I think the Unique Part Theorist can provide two such reasons.

The first reason has to do with the way in which the notion of parthood is introduced and defined in the Intrinsicality Argument. Remember that parthood is introduced here as *that intrinsic relation that Brain has towards Bob before Amputation and retains towards Bob after Amputation*. And in order to convey the metaphysical intuition of what this relation is, we called it also the relation of "being a what-it's-made-of". This relation, it is obvious and undisputed that Bob doesn't have it towards Brain before Amputation (Brain is not "made of" Bob before Amputation). But it should also be obvious Bob doesn't *acquire* it towards Brain during the Amputation: Brain doesn't become "made of" Bob; Bob remains "made of" Brain, as he was before Amputation, but the relation of "being a what-it's-made-of" doesn't become symmetrical. That should be obvious given the very nature of the relation that Brain had towards Bob before Amputation (being a what-it's-made-of). Of course, after Amputation, there are some relations between Bob and Brain that *are*

[20] Thanks to an anonymous referee for suggesting this objection.

symmetrical (for instance: "being situated at just the same place as"), but these are not the intrinsic relation that Brain had towards Bob before Amputation, and "parthood" must be the intrinsic relation that Brain had towards Bob before Amputation.

The second reason the Unique Part Theorist could appeal to will reveal something interesting about the exact purport of this paper, as an objection against WSP. The second way in which the Unique Part Theorist can account for the asymmetry of the parthood relation for coinciding Bob and Brain is by pointing out that there is an asymmetry in the *temporal* profile of Bob and Brain: Bob is no greater than Brain after Amputation, but Bob has the following temporal property: "has been greater than Brain at some time", while Brain does *not* have the corresponding property ("has been greater than Bob at some time"). In other words, when two things exactly coincide, maybe we can still appeal to their *temporal* (past or future) non-coincidence in order to distinguish them. Or if these things haven't been non-coinciding, and if we're not sure whether they will be non-coinciding, perhaps it is possible to appeal to their *possible* non-coincidence: if this possible non-coincidence is asymmetrical, then that might be sufficient to account for the asymmetry of the parthood relation for the (temporarily or contingently) coinciding entities. What this response is making clear is that while I have been arguing in this paper against WSP as a necessary and permanent principle, the scenarios and arguments I have put forward *cannot argue against some weaker* (modalized or temporalized) *version of WSP*. Here is the modalized version:

MWSP
if x is a proper part of y, then *possibly* there is a z disjoint from x such that x and z are both proper parts of y.

There *might* be arguments against MWSP. But if there are such arguments, they are not in this paper (and I am not aware of them). The argument from the Amputation Paradox is not an argument against MWSP, only against WSP. For that reason, I am happy to accept (for the sake of the argument of this paper) that this principle MWSP is true. And *if* this principle of MWSP is true, then it seems to me that we can account for the asymmetry of (coincident) parthood in terms of *possible supplementation*: between coinciding Bob and Brain, it is Brain which is the part (and not vice versa) because it is Brain that could be supplemented in Bob (and not Bob that could be supplemented in Brain).[21]

Therefore, the Unique Part theorist can account for the asymmetry of the parthood relation, even if he rejects WSP: the asymmetry of the parthood relation doesn't rest on WSP. (*Maybe* it rests on MWSP, but even that would need to be proved, given the possibility of the first response above).

[21] What if possible supplementation were itself not asymmetrical? I.e. what if we could think of some x and some y such that: (i) x and y are (now and actually) coincident, (ii) x could be a part of y with a supplement in y, and (iii) y could also be a part of x with a complement in x. This scenario seems to me to be clearly metaphysically impossible. I am not sure I can give more here than my intuition of impossibility, but so long as noone comes up with a counter-example, this intuition of impossibility seems to me to be pretty robust. Possible supplementation *is* asymmetric, and therefore *can* account for the asymmetry of (temporarilly or contingently coinciding) parthood.

6 Conclusion

We have seen that, despite the common tendency to present the Constitution View as the only theory of Coincident Entities, there is in fact an important competitor which is the Unique Part View. Even though this theory is mostly discussed in relation with the dualist version of the Amputation Paradox (namely the problem of Disembodiment), there is no substantial reason why it is so, and it should be discussed more in the context of the materialist Amputation Paradox.

Furthermore, I have argued that the main reason why this theory is rejected—namely the Analyticity Objection, according to which WSP is an integral part of the meaning of "parthood"—has to be put in balance with the intuitions we have in Amputation Scenarios, namely the intuition that some intrinsic relation is preserved in such scenarios; and I have also argued that we have a semantic intuition in favour of calling this preserved relation "parthood". The result of these reflections is that the natural language word "part" is probably torn between two conflicting semantic intuitions: one according to which parthood is a derivative relation that obeys the principle WSP, and another according to which parthood is a fundamental relation that is preserved in Amputation Scenarios.

One lesson to draw from this conflict of intuitions is that there is a good chance that Constitution Theorists and Unique Part Theorists (of Amputation Scenarios) are not in substantial disagreement about a common concept but are in fact in verbal disagreement (using the word "part" for two different relations, i.e. using different vocabularies for which we can give a translation table).

Another lesson we might draw is that, given this conflict of terminology in natural language, philosophers should propose a well motivated regimentation. And I argued in favour of a regimentation in which the common word "part" is used as an undefined word designating a fundamental relation (and not a derivative relation). If we follow this principle of regimentation, then we will arrive at a terminology in which "part" does not verify WSP.

In other words, according to the best motivated terminology, the proper theory of Coincident Entities in accounting for the Amputation Paradox should be the Unique Part View, and not the widely received Constitution Theory. This is consistent with saying that the Constitution Theory could be useful and well motivated in order to account for *other* scenarios of Coincident Entities. But the Amputation Paradox is a sufficient reason to see that, at least for this case, the Unique Part Theory is the best we have, even though it asks us to abandon WSP.

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