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Hylomorphism and Persons in Odd Situations

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Abstract. Hylomorphism provides an explanation of material composition: the material parts, the *X*s, will compose a whole, a *Y*, belonging to a given natural kind, when those parts are characterized by a substantial form. While there are a number of those who hold that each human person is identical with a human animal – 'animalists' – most of these are not hylomorphists. One could worry that hylomorphism contributes little unique to debates about personal identity, collapsing into either a form of property dualism or substance dualism. What I aim to do is apply a robust and classical hylomorphic account of persons (derived from Thomas Aquinas) to two contemporary problems, illustrating the way in which hylomorphic metaphysics can offer elegant solutions to tricky situations posed against animalists. Specifically, I will propose that *hylomorphic* animalism can help provide principled resolutions to worries that seem to undermine animalist intuitions which are raised by 'brain transplant' or 'remnant person' scenarios. Hylomorphism can capture the advantages of 'hybrid' animalist responses without the cost of denying a singular, biological criterion of personal identity. Further, hylomorphism provides a distinctive upshot for Christian theologians and the moral positions that they want to affirm by rendering morally anodyne apparent epistemic difficulties in identifying personal identity over time.

Keywords: hylomorphism, animalism, zygote, twinning, transplant, remnant.

Contribution. The sole author contributed to summarizing his research findings about hylomorphism, as well as developing the theory of hylomorphism to apply to questions of personal identity over time. A biological criterion of personal identity is put forward as plausible and defensible. The scientific contributions extend the hylomorphic understanding of that biological criterion to applications of the theory within the problems of identity of a zygote with its initial cell/s, identity of a person through a brain transplant or various forms of brain damage, and the extension of these facts to questions of the appropriate criteria for 'brain death.'

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Introduction

Hylomorphism is not a new theory. Aristotle outlined the distinction between form and matter as part of his overall explanation of material changes, correlative to his distinction between actuality and potentiality: 'form' playing the functional role of an actuality in a material composite, that which accounts for the relevant natural unity among the parts in terms of those parts being characterized by the nature of the whole, with 'matter' playing the functional role of a potentiality to take on those formal actualities. While hylomorphism plays many potential functions in metaphysics as (for example) an explanation of change, I focus here on the way that hylomorphism explains material composition: the material parts, the *X*s, will compose a whole, a *Y*, belonging to a given natural kind, when those parts are characterized by a substantial form.

Hylomorphism's distinctiveness and potential value in debates about personal identity is not always appreciated. One could worry that hylomorphism contributes little unique to debates about personal identity beyond current positions that seem similar, e.g., property dualism, animalism, substance dualism. While there are a number of those who hold that each human person is identical with a human animal – 'animalists' – most of these are not hylomorphists. What I aim to do is apply a robust and classical hylomorphic account of persons (derived from Thomas

Aquinas) to two contemporary problems, illustrating the way in which hylomorphic metaphysics can offer elegant solutions to tricky situations posed against animalists.

Specifically, I will propose that robust *hylomorphic* animalism has advantages over generic versions of animalism. I will begin by illustrating the way that hylomorphists can analyze trans-world developmental plasticity of embryonic development and then apply these insights to 'brain transplant' or 'remnant person' scenarios. Hylomorphism, I argue, can capture the advantages of 'hybrid' animalist responses without the cost of denying a singular, biological criterion of personal identity. Further, hylomorphism provides a distinctive upshot for Christian theologians and the moral positions that they want to affirm by rendering morally anodyne apparent epistemic difficulties, as our answers to some metaphysical questions about personal identity will not matter much, morally speaking.

1. Hylomorphism and Animalism

There are disputes among hylomorphists. A recent taxonomy contrasts kinds of hylomorphism according to whether substantial forms are metaphysical *constituents* of material composite objects, whether forms *cause* a composite to exemplify the nature it has, and whether parts of material composites come to depend *ontologically* for their identity/nature upon the wholes that they compose. All these claims are opposed to less metaphysically strong alternatives, on which forms are merely conceptual distinctions among material composites, under which the object falls (a sortal concept) or according to which it is appropriate to describe that object, and which does not affect the nature of the parts (Simpson 2023, 15–18). For my purposes, I will opt for a classical version of hylomorphism which holds that forms are ontological constituents which explain the nature/identity of a material composite, cause that composite to exemplify the nature it does, and affect the intrinsic nature of each part that composes that composite.

The hallmark of such views is that there is at most one substantial form in any material composite substance. While it is possible that one compos-

ite has many structures or forms of an *accidental* kind, causing that composite to have various properties, etc., multiple *substantial* forms could not potentially characterize one material composite. The latter would entail the incoherent result that there would be many substances within one substance, as substantial forms are what *cause* a substance to be that substance; substances having other substances as parts is therefore impossible (Rooney 2022, 33–62). In short, a composite substance wholly overlapping with its substance parts is not simply wholly co-located alongside them. A substantial form accounts for what the essence of something is. But then, if the *matter* of those objects had its own essence independent of the composite, substantial form would be otiose, or positing such forms would involve systematic metaphysical overdetermination and explanatory circularity. For these reasons, I opt for the view of classical hylomorphism, which holds that the *Xs* come to compose a *Y* at the time that those *X*s undergo an intrinsic change affecting their kind membership, ceasing to be substances, and thereby becoming parts (Rooney 2022, 63–96).

While hylomorphism itself is not specifically a theory of personal identity or mind-body relations, and only a metaphysics of material composition, Aquinas extends hylomorphism into an account of personal identity. For that reason, I opt more particularly for Thomas Aquinas' way of adapting hylomorphism into an account of personal identity. Patrick Toner has similarly endorsed Aquinas' hylomorphism as an account of personal identity, correlating it with the contemporary position known as 'animalism' (Toner 2011a, 2011b, 2014). I agree with this overall characterization. Aquinas is clear that human beings are essentially animals (e.g., Thomas Aquinas 1920 [hereafter ST] III, q. 50, a. 4). Further, he adopts a Boethian definition of personhood on which a person is 'an individual of rational substance' (e.g., ST I, q. 29, a. 1). That is, even though Aquinas holds the Christian view that the human soul is immortal, he holds that the human being, properly speaking, ceases to exist at death – only a part of a human being, their soul or substantial form, continues to exist *post-mortem* (e.g., ST I, q. 29, a. 1, ad 5; see Rooney 2021).

Aquinas would therefore aptly be labelled a 'robust animalist': he holds that we are essentially animals, as opposed to 'light' animalism,

which would deny any such further theses beyond the mere identity thesis of human persons with animals (Bailey et al. 2021, 2934). Many find animalism intuitive and obvious. Bailey and Blatti argue, for instance, that the animalist account of personal identity is simple and explanatorily powerful, consonant with scientific evidence that my ancestors were also (Blatti 2012; Bailey 2015, 870–871). Many likewise appreciate robust animalism as making sense of the fact that the animal who is sitting where I am looks to be the one thinking my thoughts – the simplest explanation of these facts looks to be that the animal where I am, that looks to be thinking my thoughts, and I are identical (e.g., Olson 1997, esp. 104–109; Olson 2007).

One might notice that these arguments against the 'coincidence' of myself and the animal thinking my thoughts bear noncoincidental resemblance to the view of classical hylomorphism that a single substance cannot be composed of other substances. Classical hylomorphism's view of personal identity over time closely tracks prominent animalist Eric Olson's appeal to a 'biological' criterion of identity (see Olson 1997, 23–28), rather than a 'physical' criterion on which, e.g., whether the same person persists tomorrow depends upon how much matter of that person's brain persists (e.g., Parfit 1984, 204). Hylomorphists, like Olson, explain identity over time, determining the kinds of changes of parts that an animal belonging to the human species can undergo while remaining the same animal, by appealing to criteria for membership in natural kinds (what is essential to an X qua species membership).

However, by contrast with Olson, classical hylomorphism understands 'substantial form' to be that principle in virtue of which some matter constitutes or composes an individual belonging to a given natural kind (e.g., homo sapiens). There is a *particular* metaphysical constituent of each material composite which accounts for their identity and persistence over time. The traditional term for the substantial form of a human being is his or her 'soul.' Classical hylomorphism thus appeals to the soul as that criterion for a given person's persistence over time, where the nature/identity of the parts of that person are dependent upon having the same soul and there is only one substantial soul in any human being. The com-

posite whole substance – the *man* or *woman* – is ontologically primary, such that the parts (including metaphysical constituents such as their soul) are dependent upon the composite whole human being for their nature/identity. A form exists and has an essence only dependent upon the composite, even if form is prior in some explanatory contexts (see, e.g., ST I, q. 90, a. 2; q. 76, a. 7 & 8; Aquinas 1949, q. 1, ad. 1).

These claims about the reciprocal essential dependence of form and matter sets hylomorphic animalism apart from dualistic views. Substance dualism relates mind and body as two distinct substances, without any essential relationship of one to the other. Substance dualists therefore seem to be faced with concerns as follows:

> why are parts and composite persons paired in the way in which they paired? In other words, Why do *these* parts compose *this* composite person? What is it about the parts, or the composite person, or the relationship between the parts and the composite person, which accounts for the fact that these parts compose *this* composite person, rather than some other composite person? And what is it about the parts, or the composite person, or the relationship between the parts and the composite person, which accounts for the fact that this composite person has *these* parts, rather than some other parts? (Brenner 2024, 47).

Pairing problems of this sort affect substance dualists, who need to explain what it is in virtue of which *this* body is causally paired with *this* soul. Given the substance dualist's insistence on the essential distinction of the soul from the body, as two distinct substances, the fact that they are reliably correlated – e.g., that my soul is where my body is – needs explanation.

Brenner summarizes the reasons that a 'brute fact' explanation of mereological pairing between composites and their parts would be undesirable. Such responses would undermine much of our theoretical economy and present potential epistemic problems in identifying the same composite object over time.

> If pairing relations are brute, this might strengthen the skeptical concern regarding our ability to reidentify souls or composite physical persons over time. … If there isn't any reason why this soul is paired with this body, then

> we might doubt that there is any reason why it should continue to be paired with this body. If it is a brute fact that the soul is paired with the body at one time, it is a separate brute fact that it is paired with that body at some other time, and the obtaining of one of these brute facts gives us no reason to think the other brute fact will obtain (Brenner 2024, 57).

Hylomorphism, by contrast with dualism, avoids brute fact responses to mereological pairing problems. What constitutes something as a part of a material composite involves those material parts undergoing a change in kind membership, and so in what they are essentially or intrinsically. The moment that some X constitutes me as a part of me, that X undergoes an intrinsic and essential change from one kind to another. An oxygen atom or molecule, for instance, ceases to be a substance and becomes a part of an organic molecule in my blood (Rooney 2023, esp. 55–59). The fact of its composition is thus neither arbitrary nor brute; they are not simply facts about the oxygen atom's location relative to the rest of my body or my parts, but whether those parts have undergone an intrinsic change in virtue of which they essentially depend upon their composite wholes for their identity or nature (*pace* Brenner 2024, 58–63).

While it is true that hylomorphists agree with dualists that soul and body are essentially distinct, hylomorphists conceive of the distinction between soul and body, form and matter in the human animal, as one between actuality and potentiality (Rooney 2022, 71–76). In contemporary terms, the kind of relation between form and matter corresponds roughly to that distinction between a power and its manifestation. If there were no such real or essential distinction, either every power would be always manifested or whether a power was being manifested would simply be a conceptual matter. (Neither of these options is plausible.)

Clearly, the formal principle of a human being – its soul – and the matter making up that human being are essentially and reciprocally-related metaphysical constituents of that *particular* animal. This by itself is not sufficient to resolve worries that the response simply appeals to further brute facts, since we have left unexplained why *this* form and *these* material parts are so essentially related. That is, we might think that we have explained that "this composite person exists in virtue of the exist-

ence and/or configuration of *these* parts, and that is why it has among its parts *these* parts, but not some other objects that are not such that the composite person exists in virtue of the existence and/or configuration of those objects" (Brenner 2024, 63–64). But this response just seems to posit essential relations between *these* configurations and *these* parts without explaining why such a relation obtains. If form and matter just happen to have essences that relate them to each other, this will seem to be simply brute.

By contrast, hylomorphists understand the pairing of each form to its matter to depend essentially upon the composite and the natural kind to which *the composite* belongs, as substantial form and matter relate as potentiality and actuality *of a composite*. The form and matter of a given composite can only be characterized in terms of the other, composing together the essence of the composite. Definite criteria for whether some composite undergoes changes that would undermine its nature or identity, or whether some parts come to compose that composite, follow from what is essential to the *kind* to which a given material composite belongs. Since natural kind membership is 'real' and essential to a given composite, just like powers and their manifestations are real, there are correspondingly real and intrinsic changes in the material composite by which we can identify that point at which the composite ceases to exemplify the right kinds of powers or potentials as to belong to a given natural kind. Thus, the criterion of material composition ends up devolving into issues involving the criterion for membership in natural kinds.

Now, it might be objected that such a view loses explanatory economy by introducing essences, and complex essences at that, since the essences will need to include or entail lots of facts regarding the modal possibilities of change in material parts over time. For instance, what accounts for whether a given X is a part of an animal correlates to facts about their biological nature. There are nevertheless different criteria for identity at a time, whether some X composes me, and for change of parts over time, that in virtue of which X *comes* to compose a part of me. So, the oxygen atom is part of me in virtue of it composing an organic molecule, which is an essential part of that animal which I am, and whether an oxygen atom

comes to compose me at a time involves identifying the natural kind of the oxygen atom and its criterion of identity, as well as the natural kind of me and my parts, and then identifying changes in kind over time. Certain things, like oxygen atoms, are potentially parts of certain organic molecules like hemoglobin, whereas others (e.g., radium) are not. One might therefore worry that a hylomorphic metaphysics that requires essences complex enough to accommodate all these modal facts involves a significant loss of theoretical economy over other potential alternatives.

The hylomorphist, however, can understand all such complicated facts about essences to be grounded by facts about natural kinds, which in turn are grounded by facts about the concrete material composites. Essences and their corresponding modal facts can be understood not as something *in addition to* the natural kinds (roughly, grounded independently), but as coming at 'no extra cost' once we have the individuals themselves which are intrinsically such that they belong to natural kinds. That is, what it is to be a member of a natural kind *is to be essentially such-and-such*. Indeed, the only 'real' entities that exist are the material composites, from which all these facts about their kind membership or essences or forms are ontologically derivative. Thus, even the distinctions between form and matter rest on distinctions between what it is in virtue of which a given composite belongs to these kinds, i.e., what is essential to membership, versus what it is in virtue of which members of these kinds might vary, i.e., what is accidental to membership. (It might not be that all hylomorphists wish to take this path, but it has these theoretical advantages.)

At the end of the day, the account posits precisely as many entities as we seem to need to explain the facts regarding material composites whose parts can undergo changes over time. That is, hylomorphism holds that all we need to explain these facts are the material composites themselves (although it being the case that those composites can undergo some changes in parts but not others). Hylomorphism does not then violate any obvious constraint of theoretical parsimony if we have good reason to reject that there are no material objects with parts or that the existence of material composite objects is merely a conceptual matter. And, given that I have good reason to believe that I am an animal, that I have hands,

and that it is not merely a conceptual matter that my hands are parts of me, I conclude that we have very good reasons for believing in the entities that hylomorphism requires.

The appeal to natural kind membership, and facts about the essential *biological parts* of members of these natural biological kinds, is not simply brute for hylomorphic animalists. Of course, giving a full account of the natural kinds for human beings and their parts is a largely scientific endeavor. But that is what we would expect from a robust animalist, who holds that we are essentially biological organisms. However, we can also note that the essences of biological kinds are potentially complicated in more ways than one. The identity of biological organisms can be affected by slight changes in their developmental process. For instance, distinct organisms can result from cutting a ringworm or twinning a zygote. These facts about organismic plasticity are integral to the identity of various organisms, such that two entirely distinct organisms can result from very slightly distinct developmental pathways. Biological persistence conditions more generally involve different kinds of biological structures which develop through stages, as in embryological development. Hylomorphists, I will show, have good ways to employ these facts about organismic plasticity to respond to apparent puzzles about human identity through radical changes, giving principled reasons to affirm that organismic identity is often fundamentally path dependent.

2. Zygotes and Plastic Identity

To illustrate hylomorphism's approach to facts about plasticity, I will assume that the human animal begins to exist at conception – i.e., 'conceptionism' – and show how hylomorphism can accommodate path-developmental identity of the human person with the zygote from which they came. Hylomorphists tend to take conception as that biological stage at which a human animal comes into existence (e.g., Lee and George 2008, Oderberg 1997: 265–66; see further Pruss 2011). Robust animalism is consistent with conceptionism, but many animalists by contrast with

hylomorphists are persuaded by objections from biological facts about plasticity in development to conclude that embryos and zygotes are not human animals (e.g., Smith and Brogaard 2003, 75). Since two numerically distinct individuals can come from the same zygote, the possibility of twinning is sometimes thought to show that a human organism is not numerically identical with that zygote it came from (Baker 2007, 72–73). I will illustrate that classical hylomorphism can accommodate phenomena involved in embryonic development which would seemingly undermine an animalist account on which I would be identical with the zygote from which I came.

Chunghyoung Lee has challenged the view that "human beings begin to exist with the formation of the zygote at fertilization," (Lee 2022, 297), but Lee's objection is distinct from twinning objections. Lee proposes that these twinning objections might be answered satisfactorily since, in twinning cases, an embryo with different sets of cells naturally develops into a single infant, whereas any series of steps by which those same cells would come to produce twins would involve each set of cells going through distinct series of stages that would affect their development into distinct twins. Thus, while twins do not begin to exist at fertilization, that individual from which they derive does (Lee 2022, 301–302). Because the identities of the twins can be distinguished from each other and from the initial zygote, due to the fact things went differently in different possible worlds where the twins were not produced, Lee proposes that twinning cases are those in which 'inter-world symmetry' fails to obtain. Differences in the causal processes by which each of the twins were produced from the zygote allow us to 'trace' the biological identity of the twins through possible worlds.

Lee proposes a different kind of objection. Lee points out that the developmental plasticity of zygotes entails that two distinct human individuals, with very different properties, could have been produced from one zygote *with inter-world symmetry obtaining*. Specifically, depending on their position in the development of the embryo, the cells of zygotes have the potential to yield many apparently distinct individuals, without any artificial intervention in the process of biological development:

> A 16-cell embryo is a collection of undifferentiated blastomeres such that only (about) six of them eventually yield the cells of the singleton infant it develops into, though any six have a potential to do so. So a 16-cell embryo is like a block of wood that is big enough to be made into two (or more) tables. When we have such a block, we can make either exactly one table using only, say, the left half of it or make two tables, one from the left half and another from the right one. And the production process of making a table from the left half is ontologically independent of the production process of making a table from the right one: The former process can yield the same table with or without the latter undergoing. So a numerically different table could have been made out of such a big block of wood depending on which portion of it is used. Likewise, when a zygote develops into a singleton, a numerically different singleton can develop from it depending on which six among the sixteen blastomeres are positioned inside and eventually yield the body of the resulting infant (Lee 2022, 314–315).

One of the illustrations Lee offers involves a chimeric embryo formed from two embryos with distinct genetic makeup. A chimera of this sort often naturally occurs, where two independent embryos fuse together. Depending on whether the inner cell mass of the blastosphere in further development of the embryo is formed from one or the other of the individual embryos from which the chimera was formed (which are akin to distinct material parts of that chimeric embryo, like its right half or a left half), the infant which develops from the chimera can differ in sex and many other genetic characteristics.

Since any two arbitrary persons can develop from the same undifferentiated mass of blastomeres (the material parts of the zygote), and each development process could have proceeded without the other, the worlds where the same zygote develops into two distinct individuals (e.g., Lea and Mae) look symmetrical: it is possible that "a zygote which develops into a singleton, Lea, in the actual world develops into a numerically different singleton, Mae, in some possible world" (Lee 2022, 302). Yet, as the matter and the processes are qualitatively identical, neither the matter nor the causal process accounts for the distinct individuals across these possible worlds, and so nothing qualitative seems to distinguish them. "There is no difference between these two worlds, except that numeri-

cally distinct and qualitatively identical [processes] use numerically distinct and qualitatively identical hunks of matter at different places (and times)" (Lee 2022, 300). But Lee understands conceptionism to entail that all people are numerically identical with the zygote from which they came. So, if Lea and Mae are numerically identical with the same zygote from which both come, then Lea is identical with her zygote if and only if she is identical with Mae. But they are not identical – Lea and Mae look to be numerically and qualitatively distinct people. Lee therefore concludes that conceptionism is false.

Lee rejects a potential response that the initial embryo is numerically identical with *both* potential individuals who come from it in distinct possible scenarios, since both of those individuals might differ in sex and in various other characteristics. Specifically, if an undifferentiated set of material parts might develop into numerically distinct individuals, then there was no initial fact about whether that set of material parts belonged to (or composed) any of the resulting individuals. "…at the moment at which a zygote z is formed, it is undetermined (at least by the intrinsic features of z) which part of z will later compose the inner cells of the 16-cell embryo. … So, there is no particular part of a zygote that can be reasonably claimed to constitute the one human being that the zygote is alleged to contain" (Lee 2022, 321). So, Lee concludes, we have strong evidence to conclude that the zygote at fertilization – such as the chimera – is not numerically identical with any of the individuals into which it potentially develops (Lee 2022, 313–314).

Lee's conclusion that Lea and Mae are not identical with the zygote from which they came involves appealing to the fact that none of the undifferentiated material parts of the original zygote can be plausibly identified with either Lea or Mae. Nevertheless, this fact only logically supports the conclusion that Lea or Mae cannot be identical to the zygote because they do not have numerically identical biological parts with that of the zygote. But Lee has thereby implicitly assumed a criterion of identity which animalists and hylomorphists would reject. These 'physicalist' theories of identity in which identity of the whole is determined by identity of parts over time are question-begging. Hylomorphists reject that an

individual is identical with what it was formerly by appealing to material continuity of some of its parts, independent of whether they are informed by any given substantial form. (According to the classical hylomorphist, there is *no* relevant identity of material parts apart from their substantial form). So, it is not clear why the facts about material parts that Lee highlights would be dialectically relevant against hylomorphists.

Furthermore, Lee concedes that Lea is 'a numerically different singleton' from Mae, developing from numerically distinct (although qualitatively identical) zygotic chunks of matter across possible worlds. Despite the initial state of their matter being qualitatively indistinguishable across worlds, the zygotes from which they came are likewise distinct particulars. I don't see that conceptionists need to say that Lea and Mae are identical people; they would be something like counterparts of each other, what that person would be like in a different possible world. And counterparts could be quite qualitatively different from each other. The cost of biting the bullet posed by Lee for conceptionism seems low. Further, Lee's objections might be understood to affect theories of transworld identity in general, pointing to well-known paradoxes about how to understand the limits of identity across worlds, rather than raising problems specific to conceptionism.

For the hylomorphist, Lea and Mae have distinct substantial forms, and so their matter is distinct in the sense that it composes two numerically distinct individuals, even if it were otherwise qualitatively indiscernible. The matter composing the zygote always composed either Lea or Mae, even if it was otherwise qualitatively indiscernible, just as two qualitatively indiscernible twins would be distinct human beings given the fact that there are two material composites. Even if the developmental paths and the matter of each were qualitatively indiscernible, they would be two distinct humans. Conversely, the hylomorphist can then simply deny the premise of Lee's problem that the zygote potentially underwent some essential change in becoming either Lea or Mae. If there were no discernible point at which the material composite underwent any essential change in its identity, then that material composite would be numerically identical with the zygote from which it came. Hylomorphists

need not think the acquisition of quite different properties made them distinct zygotes, rather than one and the same thing undergoing very significant qualitative changes in different possible worlds.

Lee's objection rests on the apparent difficulty in holding that one and the same human being could have come to be qualitatively distinct as pertains to what are intuitively essential properties. For instance, a chimeric embryo might have undergone natural changes that result in being either male or female. But it could seem sex is an essential property. Lee reasons that if that zygote from which I came could have ended up either male or female, then the zygote potentially underwent an essential change, and so that zygote is not essentially identical with either the male or female person which resulted from its development. But there is a potential logical fallacy in this reasoning. Zygotes are biological stages in the life of an animal when their material parts are indeterminate and undifferentiated (plastic) in such a way that very minor changes to these parts can lead to constituting very great qualitative distinctions.

Even if there were a 'sorites' question regarding the *points* at which the parts differentiate into Lea versus Mae (see Sauchelli 2019), and even if there is no external causal intervention bringing about the different developmental stages that lead to Lea or Mae, Lee too admits that the distinction between positions of cells in the zygote make no essential difference to the identity of that zygote. But it seems open to the hylomorphist to just infer from the data that there are some properties (perhaps like sex) that are not essential properties of human beings *at the zygotic stage of life*, even if those same properties cannot be changed at a later stage without destroying the individual. I see little cost to hylomorphists admitting that Lea would have been quantitatively identical with Mae, had she undergone the same natural processes by which distinct cells took distinct positions in the zygote. She developed from the same zygote, and is in that sense the same person, even if she has radically different properties.

Further, Lee's appeal to a 'natural process' without artificial intervention in the development of Lea and Mae does not establish that the processes involve inter-world symmetry in the relevant sense. As Kahn

points out, children can become radically different adults given various developmental paths, and we do not worry whether the different possible adults which result are identical with that child. There is no inter-world symmetry between developmental paths in such cases (Kahn 2022, 293, 295–296). And Lee himself pointed out that in the case of a chimeric embryo, the cells that produce the relevant differences in the resulting organism are differently positioned in the blastosphere. These cells coming to be positioned in such-and-such a way, even without external intervention, is what determines the differences between a resulting male or female fetus. But this applies rather generally to any genetically determined factors about the resulting fetus that might differ across possible worlds. Prior to the differentiation and configuration of its blastomeres, the embryo had a distinct numerical identity and was a human animal – it was simply the case that the positioning of its blastomeres put it on one or another developmental track, given the indeterminate nature of its material parts. Thus, there was no inter-world symmetry, as each different developmental 'tracks' from the initial zygote (even if there was no external intervention) are not symmetrical between those possible worlds where that zygote develops into Lea instead of Mae. 'Natural' or 'artificial' development seems irrelevant to the fact whether the developmental paths are discernible between Lea and Mae.

Lee's argument thus provides no evidence which supports the view that humans are not identical to the zygotes from which they develop, except by perhaps making implicitly question-begging assumptions about personal identity. Yet there is an important difference regarding the way in which animalists and hylomorphists potentially respond to cases like these. Hylomorphists and animalists differ in terms of what *accounts* for the numerical identity of human beings like Lea and Mae across their developmental changes and across possible worlds. Hylomorphists think that what determines or accounts for the numerical identity is their substantial form or soul – a *particular* metaphysical constituent of each composite – whereas animalists are less committed to what constitutes relevant 'biological criteria.' But, for hylomorphists, Lea and Mae having distinct 'souls' is what constitutes them as distinct material particulars

and allows us to identify the individual over time, even when matter or properties seem qualitatively identical. For instance, Lea's corpse does not have numerically the same properties as Lea, despite being qualitatively identical with those Lea had, because Lea's corpse is numerically distinct from Lea, since Lea cannot become a corpse (see Rooney forthcoming). These facts can be utilized, I propose, to deal with a distinct set of objections to robust animalism.

3. Remnant Persons and Transplants

There is a frequently discussed set of cases that seem to undermine the intuitions behind robust animalism. These cases aim to show that it is false we are essentially animals by providing (apparent) counterexamples. Duncan gives one such apparent counterexample which rests on the fact that we can keep thinking after we die, that is, after we cease to be animals. He takes such counterexamples to be obvious once we consider clearly two features of our thinking:

> First, you can be certain that your thought exists and that you are its subject. You could be wrong about all sorts of things, but not that…Second: thinking takes time. Some thoughts are short. But even '2 + 2 = 4' takes at least a few milliseconds to think. So the fact that you can be certain that your thought exists and that you are its thinker actually implies that you can be certain that you persist. So you persist. Specifically, you persist for as long as it takes to think '2 + 2 = 4.' And this very same evidence is available to anyone who is the subject of any brief, uninterrupted and unimpaired phenomenal experience. So, whenever anyone is the subject of such an experience, one can be certain that one persists (Duncan 2021, 193).

Duncan then proposes a thought experiment: "…suppose that, in the few milliseconds it takes you to think '2 + 2 = 4,' evil aliens painlessly destroy your body. The only part of you they don't destroy is your cerebrum. On the bright side, the aliens manage to sustain the normal functioning of your cerebrum. So there is no detectible phenomenal disturbance" (Duncan 2021, 193). It appears to be false that *you* would have survived

the procedure, if animalism were true, since cerebra are not animals (at least, according to most animalists). But, if it is true that you could keep thinking after the procedure, then you are not essentially an animal, since you could continue to exist after ceasing to be an animal (Duncan 2022, 6).

Duncan's problem is a version of a general problem for animalism called the problem of 'remnant persons' (Johnston 2007, 33–74; Olson 2015, 21–40). One less than compelling response from animalists is to deny the possibility of such cases (e.g., Bailey et al 2021, 2938). Duncan suggests that the core intuition relies on nothing fanciful since the phenomenal evidence of our persistence through thinking is currently evident to us – and compellingly notes that there are actual cases where people's brains continue to think after they are separated from their shoulders: "Think guillotines" (Duncan 2022, 7). A better response lies in denying that we have good enough evidence to believe that "you thought that whole thought" and instead affirm as animalists "that you were, in fact, that animal who perished" since this does not obviously conflict with any evidence we have (Bailey et al 2021, 2938). Duncan argues, to the contrary, that we are directly acquainted with ourselves and our thoughts, so that "we can be *absolutely* certain of our persistence from one moment to the next" (Duncan 2022, 8). He therefore thinks that the animalist responses are not convincing, since they rely on premises less evident than our phenomenal acquaintance with our own thoughts persisting over time.

Animalists can admit that I survive the elimination of my body while denying the intuition that the animal with which I am identical ceased to exist. Rather, if a certain subset of your body (i.e., the cerebrum) continues thinking after the rest of your body ceases to exist, we could simply conclude that *the animal* continues to exist in a diminished material state. It is therefore open to animalists to conclude that the possibility of Duncan's case would show us that while human beings are not essentially cerebra, a human being can still be essentially an animal when its body comes to be constituted solely by its cerebrum. This strategy of holding that my body comes to be constituted by my cerebrum alone does not conflict with robust animalism, as it does not deny that I am essen-

tially an animal or that my body remains an animal, organic body. All that we need is to modify persistence conditions for animals a bit capaciously (*pace* Johnston 2016, 89–127). Further, it does not follow that our acquaintance with our own persistence entails that we know how many body parts we have – and we have real-world analogates in, e.g., 'phantom limb' syndrome, where an individual continues to feel limbs that are not actually there.

And this is not as crazy as it initially seems. An animal can persist through amputations involving removing potentially large parts of the animal's body. Duncan's case involves an instantaneous amputation of most of the person's body parts, while leaving only a relatively small part – the cerebrum. But there are many similar cases of amputation or even genetic malformations, where people are born without arms, legs, etc. (animalists are not committed to saying that human animals essentially lack limbs), and therefore people can persist through absences of large portions of their body. So, the guillotine case involves a short period of time when the human being continues to live for a little while even if human animals are not *ordinarily* such that they are only a head, as they cannot ordinarily exist in the state where their head becomes alienated from their shoulders. These are not normal states of human beings, but the human being in these states is still essentially a biological animal, and their persistence conditions correlate with their bodily biology's ability to continue functioning (cf. Stump 2003, 51–54; Feser 2018, 87–101; Yang 2020). Admitting these facts would not lead to confusion whether an animal continues to exist as a corpse (*pace* Lim 2023, 667–687). And hylomorphists and robust animalists have already given similar analyses of cases like these (see Madden 2016; also, e.g., Hershenov 2021; Pawl and Spencer 2016; Eberl 2020, esp. ch. 7).

More difficult versions of this counterexample involve 'transplant' cases. These thought experiments involve my cerebrum not being simply detached from the rest of my brain but being transplanted into another body, leaving behind a remnant body with a partial brain structure. In these cases, it is unclear whether the *leftover body*, lacking a cerebrum, is an animal. Further, if we assume that the cerebrum keeps thinking,

does my personal identity 'go with' that leftover body or my cerebrum or something else? These cases have clear implications for medical ethics, since there are parallel non-imaginary cases where an individual's brain is so damaged that the cerebrum might be inoperative, whereas the partial brain structure that remains is sufficient to maintain biological function in the rest of the body. If the cerebrum alone is a person, and the remnant body with partial brain structure has ceased to be a person, we should conclude the brain dead to have truly died. Nevertheless, such a conclusion might be quite problematic and unintuitive for an animalist to take, since it seemingly appeals to psychological criterion of identity that the animal is, e.g., capable of engaging in thinking or recalling memories, rather than to the biological facts that the *organism* has not ceased functioning. And, for many Christian theologians, the result would be unacceptable; Catholic moral theology (for instance) insists that those who have suffered very severe brain damage, such as those in persistent vegetative states, remain persons (John Paul II 2004).

Not all animalists think that a cerebrum is a human animal existing in a radically diminished state (e.g., Toner 2014, 78). But a robust animalist who holds that view on which a human animal can become constituted solely by their cerebrum has implicitly endorsed a metaphysical principle on which human animals can undergo rather significant 'amputations' and remain animals. Aquinas generically agrees with such a principle, holding that the soul is present in every part of the animal, but that some parts are more central to an animal's biological life than others, e.g., certain organs, like brains (see ST I, q. 76, a. 8, ad 5). A human being without an arm is still a human being, but it seems plausible that no human being exists without a brain. This same intuition led Pope John Paul II and Catholic moral theology to infer that complete brain death would be a sufficient condition for a person's death (Pope John Paul II 2000, 89–92). What remains unresolved by the theologians is the *degree of brain damage* that would be sufficient to render an individual truly dead, and so where to draw the lines in operable criteria for brain death that would morally permit, e.g., organ harvesting (cf. National Catholic Bioethics Center 2024).

If we were to deny that the leftover body in a transplant case has what is essential for it to persist as a human animal after the removal of the cerebrum, then those whose cerebrum is so damaged as to cease to function would *ipso facto* cease to be human. While there might be some biological functions artificially sustainable in the leftover body, this is no different in principle from sustaining other organs (e.g., a heart) outside of the body for a period during a transplant. These parts do not become human animals, even though their component parts continue to survive for some time. They have undergone a change in kind membership. The human died whenever its cerebrum died. In the thought experiment, then, hylomorphists might understand what occurs in transplant cases as a full-body transplant, rather than a cerebrum transplant among two persons (Toner 2014, 86).

Our uncertainty about transplant cases plausibly results from our lack of knowledge about the brain and what parts of the brain *really are necessary and sufficient* for maintaining an integral physical composite. The particularities of where we 'cut' brain parts might be so fine-grained that typical transplant cases could be underspecified, especially given neuroplasticity. Cerebra might not be able to function without at least relevant portions of the rest of the brain. So, as opposed to guillotined heads, *cerebra* continuing to think might not be possible. I set aside these responses to the possibility of transplant cases simply because of the long-standing focus on what the metaphysician ought to say *if they were possible*. What I will show is that the hylomorphist has a unique response in the face of these unlikely possibilities.

Hylomorphists can appeal to their underlying metaphysical principles of identity according to which no given section of the brain is essential to being the same person you are. Biological plasticity seems to be quite typical biologically of several species, especially those that reproduce asexually and of many plants which can reproduce through cuttings. Ringworms and flatworms, for instance, can be cut into pieces, each of which piece develops into a complete animal. Hylomorphists like Aquinas analyze such cases as one where there was an animal pre-existing the operation, and where the operation on the animal by cutting produces

two separate individuals, in virtue of the fact that their material parts are indeterminate and can come to compose such distinct individuals (see Thomas Aquinas 1949, a. 10, esp. resp & ad 15). The same fact might be true of *neuro*plasticity, with implications for personal identity. Activities proper to a given part of the brain have been found to be 'plastic' where those activities sometimes end up taken up by other parts in response to brain damage (see Costandi 2016). There are well-known strange cases of hydrocephaly which indicate that very little brain material might be necessary to sustain relevant brain function and consciousness (e.g., Feuillet, Dufour, Pelletier 2007).

We might then analyze the possibility of transplant cases as illustrating that, prior to the developmental track by which one might segment a brain (just like a ringworm), there is no fact regarding whether any given segment of brain *will be* numerically identical with even a *part* of any potential animal that could be generated from that individually; there would be no indeterminism about whether that animal is potentially identical with another animal, but whether we can create another distinct animal from its parts, given the right kind of manipulation. If we remove the cerebrum from a person, and the cerebrum continues to think, live, and maintain its biological functions with requisite external support, and the leftover body similarly persists in its biological functions autonomously in a persistent vegetative state (or the functional equivalent), then the segmentation operation might have *produced* a new person (or two). Some animalists therefore already affirm that, if the cerebrum and body can continue to exercise their lives independently after their separation, then two human animals come into existence when removing the cerebrum from the leftover body (e.g., Skrzypek 2024; Yang 2020; see Madden 2024, 51).

I am assuming that the possibility where a cerebrum and the cerebrum complement of the brain continue to exercise their independent functions involves biological autonomy – each, with external support, could continue to live indefinitely – in addition to the cerebrum engaging in continuous thought. If the earlier responses on which the brain or head can come to compose a human being (after separation) were compelling,

then these hypothetical transplant situations would not be more anomalous (in principle) than twinning. We would have illustrated that, contrary to our intuitions, brain operations are sufficient for creating a new human being since, after the operation, there are two animals (by the same standards on which 'constitution is not identity,' and the cerebrum alone comes to constitute the animal). Plasticity in embryonic development and in neurology would constitute a kind of feature by which our material parts had the potential to *become* two independently functioning organisms *under the right circumstances* – we would just have discovered that adults too can be 'twinned' like embryos.

Classical hylomorphists hold that the identity of material parts is essentially and metaphysically dependent upon the whole – a part cannot persist as numerically the same part after its being removed from the whole, since at the moment it was removed, it *ceased being a part* of that thing and therefore is not numerically identical with what it once was. The new material thing that used to be a part might end up qualitatively quite similar, indeed, indiscernible from the part it once was. But if composition necessarily involves an *intrinsic* change in all the parts in virtue of which those parts compose the whole, then composition affects each part's identity and essence. In this regard, then, the part undergoes an intrinsic change at the moment it ceases or begins to compose the whole, and it *at least* cannot be numerically identical with that whole it once composed, as a whole by itself or as a component of another (see Rooney forthcoming). On this view, the apparent phenomenon according to which my cerebrum remains *qualitatively identical* with that material part which begins to function in someone else's skull, after a transplant, does not entail that this new material part is *numerically identical* with my brain.

Consequently, hylomorphists could hold either that the continuity in thinking of the detached cerebrum illustrates the continued identity of that cerebrum with that animal from which it came, or that the detached cerebrum constitutes a new person alongside a newly generated person constituted by the leftover body. I take no stand here on what hylomorphists should say regarding whether the original person persists through

either brain transplants or embryonic twinning, as there are many positions in the literature. Hylomorphism nevertheless has several benefits which the more generic criteria of biological persistence affirmed by animalists do not capture.

Unlike animalists who try to develop 'hybrid' views on which two criteria of persistence, one biological and the other psychological, are each individually sufficient for persistence of the human being (Madden 2016 and Noonan 2019), hylomorphists reject psychological continuity as sufficient or necessary for personal identity (being one and the same organism is what is sufficient and necessary). Hylomorphists do not need to accept anti-criterialism writ large to accept embryonic plasticity, just as they did not need to accept anti-criterialism to deal with the brain-in-a-vat situation of the detached cerebrum (as do other animalists – e.g., Lim 2023): they can instead relativize criterion for identity to the distinct biological stages of human life. While zygotes have plastic identities, given the indeterminate nature of their parts, adult human beings do not exhibit this kind of plasticity or indeterminacy. Similarly, zygotes lack cerebra entirely, and nevertheless are human animals at an earlier stage of life. Hylomorphic metaphysics can thus be extended into similar cases like those of conjoined twins (Toner 2024).

Hylomorphists can accept that a capacity to engage in thought is essential to human beings, as does Madden, who proposes an initially similar "'cluster theory' of persistence" (2024, 42), on which "the mechanisms of self-maintenance which are especially distinctive of a kind of organism get special weight in determining the persistence of that kind" – and, in the case of human beings, those mechanisms "are cognitive mechanisms" (49). Like Madden, hylomorphists can rule out that a brain could keep thinking and be a non-human animal; the fact that a given subset of the brain, such as the cerebrum, would be capable of exercising thought and experience (I do not mean simply biological kinds of brain function, but rather a situation akin to Duncan's thought experiment) outside of the body to which it belongs counts as evidence that the brain is a person. Consequently, hylomorphists have conclusive reasons to affirm that the cerebrum is now a human person.

But classical hylomorphism commits us to reject that there was either a vegetable or two human beings occupying the same space before any twinning or brain transplant operations, as substances cannot compose other substances (material co-location of two substances sharing all the same material parts is also not possible on such classical views, since a single substance, and its material parts, cannot be jointly informed by two substantial forms). There could only ever be *one* organism prior to these operations, even if there are two after (*pace* Noonan 2019, 40). Further, whereas Madden concludes we should weigh whether the leftover body or cerebrum becomes a person in terms of its maintaining more psychological activity, as these higher-level properties obtaining in the cerebrum would thereby indicate that the leftover body "must be a new (vegetative) organism" rather than a human being (49), hylomorphists have principled reasons to reject that the leftover body is a vegetable. For hylomorphists, biological criteria are sufficient and necessary for being human. Hylomorphists typically reject 'accidental animalism' on which you can cease to be an animal and remain the same person (cf. Yang 2020, 394–395). For instance, even when hylomorphists can accept Aquinas' view that thinking need require no matter at all (e.g., Feser 2024), they typically conclude that a 'separated soul' would not be a human being, since it is no longer an organism (see Rooney 2021).

For hylomorphists, there is then conversely no good reason to think psychological evidence alone allows us to conclude the leftover body *ceased* to be human when the cerebrum was removed, even if the cerebrum continues to think, since it could be either that the person 'went with' the cerebrum or remained as the leftover organism. Then, whereas hylomorphists can affirm that a detached cerebrum engaging in thought would be sufficient for that animal being human, engaging in thought would not be sufficient for hylomorphists to conclude the detached cerebrum is now that person from which it was taken, nor that the leftover body is not a human being. The leftover body is admitted by all to be biologically human. But brain damage alone is not sufficient to kill a human being, since it continues to live, although severely brain damaged. Consequently, hylomorphism alone might not be sufficient to determine

what the facts are regarding whether in the brain transplant cases the cerebrum or the leftover body is identical to the person from which it came, but classical hylomorphists should conclude definitively that (if the leftover body continues its life alongside that of the cerebrum) the leftover body is a human being or person.

4. Hylomorphic Advantage

There is obviously much more that could be said. Yet, I hope to have shown that hylomorphism potentially gives a unified account of *human* biological persistence which would be of value to robust animalists. Hylomorphism allows a unified set of criteria, by appeal to facts regarding natural kinds, according to which animalists might be able to provide powerful responses to transplant and remnant person cases – without falling into the problems of 'hybrid' theories which appeal to treating psychological and biological criteria of identity as individually sufficient for determining persistence of the human person.

Further, while it will be no less tricky for hylomorphists than for animalists to distinguish, as in twinning cases, where the 'original person goes' after the relevant operation, hylomorphists can affirm in principle that there would be empirical discernibility. Hylomorphic criteria of personal identity holds that facts regarding numerical identity follow the 'developmental paths' by which the parts were removed, functions taken over, etc. "…the path along which the animal will persist at one moment is fixed by its intrinsic character at an earlier moment" (Madden 2024, 50). I have argued that facts of plasticity in development do not undermine that we are identical with the zygotes from which we came, and the fact that my brain might be so plastic as to permit the generation of a new animal after removal of my brain does not entail that the cerebrum or 'leftover' body would not be me. But, in principle, the relevance of one path over another for persistence could be determined by the way in which those paths affect the intrinsic identity and character of the organism.

Second, hylomorphism has a decided ethical/theological advantage over generic robust animalism: whatever the metaphysical facts about identity (i.e., whether you 'go with' the cerebrum or 'stay' in the leftover body that continues to exercise biological functions), hylomorphism allows a straightforward way to reconcile the apparent problems regarding ethical judgments about partial brain death. The 'leftover' body would also *still be* a person in virtue of being an organism, regardless of facts about who it is. Consequently, the Catholic Church's ethical claim that intentionally killing the human being that remains after partial (but not total) brain death would constitute murder can be defended as the correct judgment, without determining further facts about personal identity of that human being.

Determining whether I 'go with' either my body or my cerebrum, and whether the new body into which that cerebrum is transplanted hereafter composes me, then, will largely depend upon empirically discernible facts regarding biological and neurological plasticity. Yet, whatever those facts are, hylomorphists are in a good position to affirm a view on which those metaphysical facts about personal identity play a less interesting role than otherwise supposed, because we don't need to determine *who's who* to affirm that we cannot kill *whomever it is*, because they remain essentially human. And we know this because human identity is biological. In this peculiar sense, hylomorphism permits us to hold a biological account of identity and nevertheless affirm that identity does not matter much (cf. Parfit 1997) – we still know that the resulting human being is a person and that their actions, as well as our treatment of them, would matter, *whoever that person is*.

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