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Human Persistence

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1. Introduction

A great deal of work in the contemporary personal identity debate is driven by the assumption that the following two theses are incompatible:

(A) We are fundamentally biological organisms of a certain kind.

(B) We would go with the cerebrum.

Each is attractive. Thesis (A) seems to be little more than a commonplace of our post-Darwinian worldview. Thesis (B) receives strong intuitive support from reflection on counterfactual cases of a sort familiar to analytic philosophy since the mid-20th century, cases which make it compelling to judge that the psychological continuity secured by the isolation or transplantation of a cerebrum would be sufficient for our persistence.

But it is usual to find those who adhere to the "animalist" thesis (A) trying to explain away, or discredit, the highly intuitive thesis (B). Conversely, those who take (B) as bedrock in their theorizing usually regard it as a primary motivation for rejecting (A) and for developing anti-animalist, principally Lockean, views of our fundamental nature.[1]

The aim of this paper is to argue that these endeavors rest upon a mistake. On the basis of a plausible general framework for theorizing about the nature and persistence of macroscopic continuants, it can be shown that, far from being incompatible, thesis (A) in fact strongly supports thesis (B). A settled and coherent view of our nature and persistence can incorporate both theses.

Once the general framework is set out, the positive argument for the compatibility claim will be fairly straightforward. Its key point is that the cerebrum preserves a high number of capacities for activity characteristic of the relevant kind of organism. A greater part of the paper will be given over to defensive and diagnostic tasks, to rebut

1. For examples of adherence to (A) motivating rejection of (B), see Snowdon 1990, Ayers 1991, Olson 1997, Mackie 1999. For examples of adherence to (B) motivating rejection of (A), see Shoemaker 2008, Johnston 2007, Noonan 2010, Parfit 2012.

objections, and to try to make some sense of the prevalence of the mistaken assumption that the theses are incompatible.[2]

Before pressing on with these tasks it may be helpful first to give some context. The aim here is not to defend (A) or (B) individually. But a brief reminder of the costs of giving up either thesis should serve to underline the importance of a demonstration of their compatibility.

The thesis that we are fundamentally biological organisms of a certain kind, specifically human primates, has been presupposed by the various sciences of human nature — biology, anthropology, sociology, psychology — for well over a century, and can reasonably be said to form part of our scientifically informed common sense. Of course philosophers should be prepared to question common sense. But there are obstacles to giving up (A) of a more theoretical nature. Olson and others have forcefully directed "the problem of the thinking animal" against those who claim to distinguish us from the human animal. The problem is that human animals seem to meet the conditions for thinking (they have functioning nervous systems, for example). But if they do, then how could one possibly distinguish oneself from the human animal thinking at one's location?[3]

A more basic theoretical challenge for anyone who rejects (A) is to give an alternative account of our fundamental nature that can be taken seriously. For an indication of the difficulty of this challenge, it is enough simply to state the most recent alternative accounts from major figures who have felt compelled to reject (A) on the basis of adherence to (B). Parfit claims that we are fundamentally "thinking parts", entities a few inches high riding around inside the skulls of human primates (Parfit 2012). Johnston insists that we are, in principle, only temporarily animals, and fundamentally "protean" persons, universal-like entities, which may become multiply located throughout space and time in virtue of the projection of our future-directed concern (Johnston 2010).

If the rejection of (A) leads to such views, then, in the light of the widespread assumption that one is forced to choose between (A) and (B), it is unsurprising that others have instead attempted to come to terms with the rejection of (B). But this, too, is hard to swallow. First, note that the thesis that we would go with the cerebrum is a generic claim, covering importantly different cases: notably a *remnant* case, in which a human animal is pared down until only a supported "cerebrum in a vat" remains, and a more complex *separation-and-attachment* case, in which a cerebrum is carefully separated from the head of an otherwise unscathed human animal and attached into the head of a living human animal missing a cerebrum.[4] Accordingly (B) will be understood as conjoining the two more specific theses:

(B1) We would go with the cerebrum in a remnant case.

(B2) We would go with the cerebrum in a separation-and-attachment case.

Both are compelling. We are strongly inclined to judge that the continuous preservation of our diverse and highly specific psychological capacities would be sufficient for us to persist if cut down to a cerebrum in a vat, and also for us to move to the location of the person resulting from the attachment of the cerebrum to the recipient organism. Few will feel comfortable accepting a theory of our nature that forces the rejection of either (B1) or (B2).

2. Is a compatibilist position defended elsewhere? Some of McDowell's comments on Locke's Prince and the Cobbler case suggest a compatibilist view (1997: 237; 2006: 115). But his comments do not flow from an explicitly stated theory of the nature and persistence of macroscopic continuants, nor does he anticipate objections of the sort to be considered at length below. Thus he cannot quite dispel the impression of trying to have it both ways. Wiggins is a more complex case. The argument to be developed in this paper is, in a very general way, indebted to his metaphysical picture. But his attitude to the compatibility of claims like (A) and (B) seems to have varied over the years, from positive (1967: 55) to neutral (1980: 188–189) to negative (2001: ch 7) and back to neutral (2012: 20).

3. Olson 1997. Cf. Snowdon 1990.

4. Shoemaker's famous Brown-Brownson story (1963) is the seminal description of a separation-and-attachment case.

There are more theoretical obstacles to giving up these intuitive theses. For example, suppose, contrary to (B1), that one does not persist in the remnant case. Then where did the conscious subject in the vat come from? Was a new conscious subject brought into existence by carving away extraneous flesh? That is difficult to believe. On the other hand, if this conscious thing was not brought into existence but was present before the operation, then how could a denier of (B1) claim to know that one is something that would not persist rather than the conscious thing which would persist through the operation?[5]

There is also the general difficulty of convincingly explaining away, or discrediting, our strong inclination to judge (B). Olson (1997) makes an attempt, claiming that we confuse the typical prudential, moral, and social concomitants of persistence with persistence itself. He suggests that we would be rational to extend moral accountability and selfish future-directed concern to the thing which inherits our psychology, and on this basis we mistakenly believe that the thing would be the original individual. Another animalist opponent of (B) emphasizes instead that the resulting "transfer of someone's self-awareness" (Ayers 1991: 291) would produce in the recipient subject the "profound illusion" that he himself is the original animal, an illusion it would be so "immensely convenient to fall in with" that we are drawn into judging (B).

Without going into the details of these putative explanations, a general critical point can be made. Any appeal to attributes distinctive of human persons, such as moral accountability or self-awareness, will struggle to generalize to the apparently similar intuition that a non-human higher animal, such as a cat, could be stripped of its fur, stripped of its limbs — indeed could be cut right down to its cerebrum — to be re-equipped with a new body so as to continue its characteristic feline life. It is not plausible that our similar intuition here could be explained by the transmission of moral accountability or self-awareness. A cat has none of these personal attributes.[6]

5. This style of objection is pressed by Johnston (2007) and Parfit (2012).

6. More serious explanations of the intuitiveness of (B) are likely to be found in ongoing work on the animate–inanimate distinction in developmental and cognitive psychology. Studies suggest that from early infancy our processing of the behaviour of sensitive, motile entities such as animals and human beings is structured by the principle that their self-movement is initiated and sustained by some cause internal to their boundaries (Gelman 1990). Moreover, there is evidence that from an early age we are disposed to judge that the preservation of something *inside* an animate entity is crucial to its preserved identity over time (Gelman and Wellman 1991). In the light of these empirical studies it is an obvious hypothesis that we should be disposed to judge that when an animate creature is cut down to its internal "engine of animation" — the cerebrum as it is envisaged in philosophical discussion — the creature has persisted. Would a supporter of (A) be right to conclude from the availability of such a psychological explanation that the intuitive support for thesis (B) is thereby discredited? On the contrary, as it will be argued, our cognitive processing in this case basically corresponds to the facts as they are revealed by more theoretical reflection. It is theoretically plausible that an animate organism such as a human animal would persist when cut down to the realizer of its animate capacities.

Here is the plan in more detail: I begin by sketching a fairly familiar framework for theorizing about the nature and persistence of kinds of macroscopic continuant. This framework is then instanced with the kind relevant to thesis (A) — the kind *human animal* — and applied to the remnant case in order to show first that (A) strongly supports (B1).

I turn then to objections to the proposal. The first to be dispatched are relatively superficial complaints: that the remnant case is like any other case of mere organ preservation; that the organism has lost too much of its size and shape; that the proposal drains "animalism" of its distinctive content, collapsing into a Lockean psychological continuity view. The reply to the latter objection is that the proposal does not have the consequence that psychological continuity is necessary for the persistence of a human organism: the proposal permits that a human organism could, as seems plausible, persist if reduced to the condition of a non-cognitive human vegetable.

More time will be spent on two more theoretically substantial lines of objection. The first objection is that the compatibilist proposal implausibly separates organism persistence from the possession of "life", understood as a certain kind of capacity for collective metabolic activity of microscopic parts. The emphasis on this capacity in the

development of contemporary animalism originates in the idiosyncratic but influential reductive-mereological project of van Inwagen. It is argued that there are good reasons not to elevate this capacity over other kinds of adjustment and regulation capacities characteristic of organism kinds.

The second substantial complaint is that the proposal cannot plausibly describe the more complex separation-and-attachment case, in which a smaller object is moved between two larger human animals. This is particularly pressing if, as seems plausible, human organisms can persist in a non-cognitive, vegetative state. If the proposal is that the human organism moves with the cerebrum, then what can one say about the vegetative human organism left behind? And what about the vegetative human organism that receives the cerebrum?

In response to these queries it will be argued that the right model for such cases is furnished by actual cases of cutting and grafting of organisms, a perspective which is likely to have been obscured by the fact that, in focally realized organisms such as higher mammals, preponderance of material bulk is an unreliable guide to dominance in asymmetric fission and fusion. The conclusion is that the animalist thesis (A) strongly supports the intuitive "Brown-Brownson" verdict (B2), as well as the intuitive remnant verdict (B1).

2. The Nature and Persistence of Macroscopic Continuants

Our initial fix on macroscopic continuants, such as boulders, cats, and trees, is their immediate engagement of our perceptual systems. Further experience reveals that the activities of these entities figure in a range of law-like generalizations which enable us to systematize and explain external phenomena. A macroscopic continuant is, most fundamentally, a locus of law-like activity characteristic of its general kind.[7]

What about the persistence through time of a macroscopic continuant? In the light of the general conception of its nature as a locus

7. Wiggins 2001 is an extended elaboration of this broadly Aristotelian picture.

of activity characteristic of its kind, a natural way to conceive of the persistence of a continuant of fundamental kind *K* is in terms of the preservation along a path of a sufficiency of capacities for activity characteristic of *K*s. Here is the schematic principle which will be assumed henceforth:

> (Persistence) A continuant of fundamental kind *K* persists if and only if a sufficient number of capacities for *K*-characteristic activity are continuously preserved (along a dominant path).

Some clarifications and examples will help bring the picture to life.

Why "capacities" for activity? Take an artifact of the *toaster* kind. We take it that a toaster can persist unplugged from the power socket. But we do not take it that a toaster can persist mutilated right down to a power cord. One factor in our judgments is this: although the unplugged toaster does not occurrently toast bread, it retains the capacity for this activity characteristic of its kind. Its improbable intrinsic structure and organization is such that it would take only a relatively simple external intervention (plugging-in) for that characteristic activity to occur. In contrast, the simpler intrinsic structure of an isolated power cord is such that the external intervention on the object required for bread-toasting to occur would be so complex — in effect amounting to the construction of most of a toaster — that the external intervention cannot reasonably be said to be a mere trigger for the manifestation of a capacity for bread-toasting abiding in the power cord all along. At best, the power cord has the capacity to contribute some partial sub-activity (transmitting current) to the bread-toasting activity of a larger system.

Why the emphasis on "activity"? Doesn't that notion fail to apply to inert continuants such as boulders? No. Despite its busy connotations, the notion absorbs the relevance of brute continuities of matter and shape. There is no reason to exclude such activities as filling

spatial receptacles of certain shapes, resisting penetration, or rolling down slopes.

Note that the activities characteristic of a macroscopic kind *K* are macroscopic activities of a whole individual *K* rather than its small parts. This is not to deny that there may be interesting collective conditions that must be met by the microscopic parts of a *K* in order for these macroscopic activities to occur. But we are justified in recognizing the existence of macroscopic entities over and above pluralities of microscopic constituents by the existence of law-like generalizations concerning the activities of *K*s themselves.

To say that *K*-characteristic activities are activities of individual *K*s rather than activities of their microscopic parts is not to say that these macroscopic activities must be somehow superficial or manifest, in the sense of being easily perceivable. Digesting and visualizing are activities of whole human animals, but they are not easily perceivable. Nor need whole-*K* activities be manifest in the sense of being a priori deducible from one's conception of *K*s. One may have to learn from bitter experience that toasters have the capacity to give electric shocks.

Why does (Persistence) mention a "sufficient number" of capacities for activity?

Typically, for a given kind, there is a wide range of activities characteristic of that kind. So the default presumption about any single one of its capacities should be that its preservation is not individually metaphysically necessary for the persistence of the entity. The entity could persist without that capacity if a sufficient subset of its other kind-characteristic capacities is preserved. For example, the capacity for purring is characteristic of the cat kind. But an injured cat can persist through the loss of this capacity so long as it retains sufficient other capacities characteristic of its kind (breathing, hunting, excreting).

The notion of sufficiency is vague. One should not always expect to be able to deduce whether a *K* has persisted from independently specifiable facts about the number of characteristic capacities preserved. A realistic epistemology will recognize reciprocal evidential support between judgements of sufficiency of preservation of capacities and judgements of identity over time.

The "dominant path" clause is intended to handle fission cases in a familiar way. But it is worth noting that there is no assumption that a single dominant path of preservation of kind-characteristic capacities must exclude spatiotemporal forking or other scattering of matter. That will depend upon the kinds and capacities in question. For example, a watch can persist disassembled into components for cleaning. Why? Given the improbably neat matching of the components and their proximity on the technician's table, it would take only a relatively simple intervention to trigger characteristic time-keeping activity. This supports the supposition that kind-characteristic capacities are preserved. In contrast, if the watch were smashed into small particles, then all such intrinsic organization would be lost, and the complex external intervention on the plurality required to bring about time-keeping activity could not exploit any abiding structure. So it is plausible that the kind-characteristic capacity would not have been continuously preserved. It is correspondingly plausible that a watch does not persist if smashed into small particles.

The capacities for activity of some kinds of continuant are realized in a more "distributed" and less "focal" pattern than the capacities of other kinds of continuant. For example, the characteristic capacities of a homogenous material concretion such as a rocky boulder — to squash relatively soft things, to block certain gaps — are not obviously realized in some parts more than in any others. In contrast, the capacities of a computer with a small but sophisticated microprocessor and bulky metal case are realized more focally. Such a computer could be refitted with a new case despite the temporary but dramatic change of form and appearance this would entail. Why? Due to its focal realization, the temporary loss of some of its space-filling and paperweight capacities is consistent with the continuous preservation of a much larger number of other capacities for kind-characteristic activity.

3. Human Animals

We have sketched a general framework for reasoning about the nature and persistence of macroscopic continuants. In order to explain why thesis (A) strongly supports thesis (B1), this framework needs to be applied to thesis (A), the thesis that we are fundamentally biological organisms of a certain kind.

What is the relevant kind of biological organism? The relevant kind is not *box jellyfish*, *shiitake mushroom*, or *hedge sparrow*. The relevant kind is *human animal*. Specified in this way, (A) combines with the (Persistence) schema to yield the following principle about our persistence:

> (A-Persistence) One of us persists if and only if a sufficient number of capacities for human-animal-characteristic activity are continuously preserved (along a dominant path).

In order to appreciate the consequences of this principle, more needs to be said about the activities characteristic of human animals. The variety is enormous, but we can begin a list:

> Breathing, sleeping, snoring, pointing, listening, walking, running, jumping, tool-using, gossiping, planning, remembering, fantasizing, excreting, eating, mating, drooling, seeking shelter, filling "humanoid" spatial receptacles, growing, ageing, fighting infection, ailing, dying, mourning, hunting, relaxing, visually attending, problem-solving, blocking light, resisting penetration, sweating, painting, singing, story-telling, fidgeting, digesting…

First observe that the activities characteristic of human animals include, but are not restricted to, activities characteristic of simple material concretions (resisting penetration). They also include, but are not restricted to, activities characteristic of most kinds of terrestrial organism (growing, excreting). What is distinctive of human organisms in particular is the spectacular intensification of the "animate" capacities for sensitivity and motility which characterize every zoological organism.[8] Human animals are peerless in their sensitivity to abstract patterns in the world, and in their capacity for complex and extended courses of action — capacities impressively combined in communication and problem-solving. But these are just the development in certain respects of the sensitivity and motility characteristic of every animal kind. The more or less sophisticated co-ordination between sensors and effectors is, as Peter Godfrey-Smith puts it, "part of the 'design skeleton' of any organism that has to adjust its activities to what is going on around it".[9] An animal is an organism with a pressing need to adjust its activities to what is going on around it; unlike a plant, it must seek out organic matter in order to regulate its nutrient and energy levels. Animals' sensorimotor means to maintenance of their nutrition and metabolism is a particular exemplification of the generally self-regulating or "homeostatic" nature of all living organisms.

Developing (A) in this way, we see that a theoretical role for psychology in our persistence need not derive from a metaphysical fetishization of the "personal" capacities for moral responsibility, self-reflection, and so on, which distinguish us from other animals. If (A) is true, then psychological capacities are relevant to our persistence for the reason that they are relevant to the persistence of zoological organisms of any kind. They are among the capacities characteristic of the organism kind to which we belong.

Perhaps it is a result of the long shadow cast by the 20th-century opposition of "bodily" and "psychological" criteria of personal identity, but there is a tendency in the contemporary debate to suppose that the distinction between "biological" and "psychological" capacities is an exclusive one. However, the sensorimotor capacities characteristic of

8. Marine sponges are sometimes considered to be an exception, having managed to meet the distinctive animal need to consume other organisms for energy without development of a system of neurons. But note that even these organisms possess cells genetically akin to synaptic cells, with a probable role in coordinating rudimentary contractions and environmental sensitivity. See Nickel 2004 and Sakarya et al. 2007.

9. Godfrey-Smith forthcoming.

animals are no less "biological" than any other specific mode of organismic self-regulation, such as the capacities for transpiration and photosynthesis characteristic of botanical life forms. None of these specific capacities is characteristic of every kind of organism on earth. But why should that matter?

4. The Remnant Case

Thesis (A) combined with the general (Persistence) schema yields (A-Persistence). The intuitive thesis (B1) — that we would go with the cerebrum in the remnant case — will follow in turn if (A-Persistence) is combined with the following additional thesis:

> (Sufficiency) The remnant cerebrum case continuously preserves (along a dominant path) a sufficient number of capacities for human-animal-characteristic activity.

Is (Sufficiency) plausible? In the case as it is envisaged in philosophical discussion, a human organism is cut down and the cerebrum is provided with some form of life-support system so that there is a subject continuing to exercise various capacities — such as action-planning and visualizing — and preserving many more psychological capacities that are blocked from outward manifestation by the lack of other body parts. If this picture of the case is accurate to the empirical facts about the anatomical structure in question, then (Sufficiency) is indeed extremely plausible. In this situation a very large number of characteristic capacities of the human organism kind would be continuously preserved (along a dominant path).

But why would this be a "sufficient" number? It might be objected that there is no reason to suppose that the preservation of the capacity for thinking would be sufficient to compensate for the loss of human organism capacities controlled lower in the central nervous system, such as breathing or excreting.

The objector's single term 'thinking' grossly underestimates the number and diversity of human-organism-characteristic capacities preserved: colour discrimination, grammatical string detection, social hierarchy navigation, duration sense at different temporal scales, vertical–horizontal line discrimination, face recognition, place recognition, practical know-how, auditory phoneme individuation, predictive naïve physics, story-telling, episodic memory. A single term like 'breathing' covers no parallel multitude of distinguishable capacities characteristic of human organisms.

One might raise another line of objection. The (Sufficiency) thesis mentions a very specific anatomical structure, the cerebrum. Given our present state of understanding of the realization of human psychological capacities, this thesis can be no more than a piece of dubious empirical speculation.

There is something to this objection, but its force should not be exaggerated in the present context. The remnant cerebrum case in philosophical discussion is intended to lie at a certain conceptual point on a spectrum of possible empirical cases. At one end of the spectrum are uncontroversial cases in which a human organism persists through more or less severe loss of parts — for example, the case of a human organism which loses its legs but is saved from fatal hemorrhage. In this case it is clear that a locus of human-animal-characteristic activity endures.

At the other end of the spectrum are cases of the following sort: flesh is cut away from a human organism until nothing is left but a small patch of living tissue from the visual cortex. It is implausible to suppose that the human organism survives the latter process. Why? There is nothing remaining in that situation with a range of capacities for activity characteristic of a whole human organism. In order to bring about such activities, the relatively simple patch of tissue would require extremely complex intervention, amounting to the construction from scratch of a new subject of such activity rather than the triggering of a capacity for activity on the part of the tissue sample itself.

Where does the remnant cerebrum case lie on this spectrum? The case is designed to be a limiting example of the first kind of case. This is not to deny that it is likely that a cerebrum would require some

technically sophisticated life-support and stimulation in order to trigger the occurrence of human-organism-characteristic psychological activity. But this intervention would be so dwarfed in its contribution by the cosmically impressive complexity of the abiding structures in the cerebrum that it is highly plausible to regard psychological capacities as preserved by the cerebrum, even if some external triggering is required for their activation. It is a case in which a high number of human-organism-characteristic capacities are preserved.

There is some empirical evidence that the neural correlate of conscious activity includes traffic between the cerebrum and sub-cortical structures such as the thalamus.[10] If so, then perhaps (Sufficiency) should be replaced by a variant claim, mentioning a larger part of the central nervous system than the cerebrum. This variant claim could not be used in combination with (A-Persistence) to soundly infer (B1). Would that undermine the present argument? No. (B1) is found widely intuitive not because many philosophers have detailed empirical knowledge of the cerebrum in particular. It is found intuitive because the cerebrum is conceived to be the minimal realizer of a diverse range of specific psychological capacities. If it emerges that something slightly larger than the cerebrum plays this role, then (B1) would no longer be the relevant intuitive thesis and it should be modified accordingly, to mention the larger part of the central nervous system. Thus (Sufficiency) and (B1), insofar as they are empirically and intuitively plausible respectively, will continue to march in step. That is why one should not exaggerate, for present purposes, the significance of the limitations of our knowledge of the precise neural basis of human psychological capacities.

So, for simplicity, we shall continue to make the assumption that it is the cerebrum that minimally preserves a high number of human-organism-characteristic capacities. On this assumption the case is strong that the naturalistically attractive animalist thesis (A) supports the highly intuitive thesis (B1): the cerebrum continuously preserves a high number of capacities for activity characteristic of the human organism kind.

10. Rees, Kreiman, and Koch 2002; Alkire and Miller 2005; Merker 2007.

5. Objections and Clarifications

It will strengthen the case to anticipate further objections.

It might be objected that the remnant cerebrum case is no different from other cases of mere organ-preservation.[11] A kidney composed of living tissue could be preserved after the destruction of the rest of a human organism. This entity is about the same size as the cerebrum in the vat. So how can the present proposal avoid the absurd consequence that a human organism could become a kidney?

First, a clarification is in order. The proposal is not that a human organism could turn into one of its organs. On the standard assumption that numerical identity is not temporally relative, nothing could become identical to what was once its proper part. The proposal is rather that the human organism could be reduced down to coincidence with its cerebrum.

So the objection should be reformulated: How can the present proposal avoid the still absurd consequence that a human organism could be reduced down to coincidence with its kidney?

The crucial disanalogy is this: a "kidney in a vat", even if carefully stimulated to intrinsic activity matching its intrinsic activity when contained within a larger organism, is not thereby sufficient for the presence of something engaged in activity characteristic of a whole human organism. It is merely idly performing a sub-activity, with the potential to contribute to a whole animal's activity of excretion should it be coupled to an animal's bloodstream in the right way. In contrast, a cerebrum in a vat stimulated to intrinsic activity matching its intrinsic activity when contained within a larger organism *is* sufficient for the presence of something engaged in various activities characteristic of a whole human organism: there would be thinking, planning, visualizing, etc., and the blocked capacities for much more.

11. This is a common animalist claim. See Snowdon 1990: 98, Snowdon 1991: 112–113, Olson 1997: 18, and Olson 2007: 42.

Suppose that one insists, perhaps by means of a suitably permissive understanding of 'excreting', that the kidney in a vat is capable of doing something that a whole human organism can do. Still, the disanalogy between the cases is dramatic. The relatively simple kidney does not preserve anything like the diverse range of capacities for human organism activity preserved by the cosmically complex structure of the cerebrum. So there is no parallel support for a kidney-analogue of (Sufficiency).

A related objection complains that too much of the size, shape, and appearance of an animal would be lost in the remnant case for it to be plausible to say that an animal has persisted.

The right response here is that a human organism is a highly focally realized continuant, so that the loss of stereotypical size, shape, and appearance is no overriding obstacle to its persistence, being perfectly consistent with the preservation of a sufficiency of capacities for kind-characteristic activity. The tacit but probably widespread presupposition that animalism must be a "body" theory of personal identity is likely to have made this option difficult to discern. If it is imagined that a human organism is a material concretion of the same category as a boulder — something along the lines of a homogenous, humanoid statue of meat — then, just as a classical Greek statue could not be reduced to the size of a small oblong chunk of marble contained within its head, neither, it will be imagined, could a human organism be reduced to the size of its cerebrum. But this imagery fails to acknowledge that the realization of kind-characteristic capacities of a human organism is not distributed like that of a homogenous material concretion.

This invites a further point of clarification. If (A) is developed in this way, then indeed animalism contrasts with a "body" theory of personal identity. But, on the other hand, if (A) has the consequence that we would go with the cerebrum in a vat, doesn't animalism collapse instead into a familiar kind of Lockean psychological continuity theory of personal identity?

So says Parfit, in a recent discussion of the claim that a human organism could persist in a remnant cerebrum condition:

> If Animalists made this claim, their view would cease to be an alternative to Lockean views. On the Lockean Brain-Based Psychological Criterion, some future person would be me if this person would be uniquely psychologically continuous with me, because he would have enough of my brain. This criterion implies that, in Surviving Cerebrum, the conscious being would be the same person as me. When Animalists entered this debate, their main claim was that such psychological criteria of identity are seriously mistaken, because we are human animals, so that our criterion of identity must be biological. If these Animalists now claimed that, in Surviving Cerebrum, the conscious rational being would be a living animal, who would be me, these people would be claiming that the true criterion of identity for developed human animals is of this Lockean psychological kind. (2012: 12)

It is certainly true that Olson's well-known entry to the debate took the "radically non-psychological" (1997: 16) view that psychology is "irrelevant" to our persistence. But if anything deserves to be called the "main claim" of animalism, it is simply the claim that we are fundamentally biological organisms of a certain kind. A principled development of that main claim can do justice to the fact that more or less impressive sensorimotor capacities are among the biological capacities characteristic of organisms of our kind, and every animal kind, and are thus not irrelevant to our persistence.

So is Parfit right to say animalism developed in this way is claiming that the criterion of identity for developed human animals is a brain-based Lockean criterion? Parfit is not right to say this. A Lockean theory of personal identity claims that psychological continuity of some kind is necessary and sufficient for us to persist. The present

development of (A) holds that the continuous preservation of psychological capacities can be *sufficient* for us to persist, because these capacities are among those characteristic of the organism kind to which we belong, and in general the preservation of a sufficient number of *K*-characteristic capacities is sufficient for the persistence of a *K*.[12] But this application of the general conception of the persistence of macroscopic continuants does not support the distinctively Lockean claim that brain-based psychological continuity is *necessary* for us to persist. The proposal is perfectly consistent with the claim that the cerebrum of a human organism could be rubbed away entirely, leaving the organism in the condition of a non-cognitive human vegetable. Such a case would involve the loss of a massive number of capacities characteristic of human organisms. But, in virtue of the preservation of the lower part of the central nervous system, a still diverse range of capacities characteristic of human organisms would be preserved along a unique path. The remaining part of the nervous system is less complex, but it nevertheless continues to realize, along a unique path, characteristic capacities, for breathing, excreting, drooling, sweating, and so on. These, it seems perfectly natural to say, are a sufficient number of capacities for the persistence of a human organism. But there is no psychological continuity of the sort Lockeans claim to be necessary for our persistence. Sometimes it is right to rethink well-worn depictions of opposing camps in the philosophical literature, but the distinction between animalism and Lockeanism stands up even when animalism is developed in a way that supports the intuitive verdict about the transplant case.

This clarification invites two more substantial questions. First: why has Olson, the most prominent advocate of the animalist view (A), claimed that psychology is completely irrelevant to organism persistence, thus closing off the option of incorporating the highly intuitive thesis (B1) into a settled and coherent view of our nature and persistence?

Second: if it is a consequence of the present proposal that a human organism may persist in the remnant cerebrum case, but also a consequence of the proposal that a human organism may persist as a non-cognitive human vegetable, then doesn't the proposal shake itself to pieces when it comes to describe the separation-and-attachment case, in which a cerebrum is transferred between two vegetative human organisms?

The final two sections of the paper take these questions in turn.

6. Life

Here is Olson's view of our persistence conditions:

> What it takes for us to persist through time is what I have called *biological continuity*: one survives just in case one's purely animal functions — metabolism, the capacity to breathe and circulate one's blood, and the like — continue. I would put biology in place of psychology, and one's biological life in place of one's mind, in determining what it takes for us to persist: a biological approach to personal identity. (1997: 16–17)

Olson's view in effect subtracts sensorimotor and other psychological capacities from the list of capacities for activity characteristic of human organisms, and holds that the remaining capacities — or perhaps some sufficient subset of them — are necessary and sufficient for one to persist, a position structurally similar to the Lockean view that instead selects just the psychological capacities as necessary and sufficient for one to persist.

The present proposal agrees with Olson that the preservation of a fairly rich set of non-psychological capacities is sufficient for a human

12. Although, just to be clear, according the view defended here, not every case of psychological continuity familiar from the personal identity debate will be a case in which one persists. For example, a case of tele-transportation which involves an interval of pure information-transmission between dissolution of terrestrial matter and organization of Martian matter cannot be a case in which relevant capacities are continuously preserved. During the interval there is nothing with human-animal-characteristic capacities.

organism to persist. In the vegetative case, a locus of kind-characteristic activity endures. Where the present proposal differs from Olson is that it is has no commitment to the claim that these particular capacities, realized in the lower autonomic nervous system, are metaphysically *necessary* for the persistence of a human organism. If sufficient other human-organism-characteristic capacities are preserved, then the human organism persists. That is why the human organism can persist in the remnant case. The cerebrum, in fact a far more complex structure than the lower part of the central nervous system, realizes a high number of human-organism-characteristic capacities.

So why does Olson elevate broadly autonomic capacities — for breathing, blood-circulation, etc. — into a metaphysically necessary position over sensorimotor and other psychological capacities of human organisms?

An uncharitable explanation is suggested by the imagery of "put[ting] biology in place of psychology". This may reflect a failure to appreciate that sensitivity and motility are characteristic of every kind of zoological organism and a specific expression of the generally sensitive and self-regulating nature of biological life.

Another uncharitable explanation would be this: the sound point that a human organism can persist without psychological capacities has been misinterpreted as supporting the claim that psychological capacities are completely irrelevant to human organism persistence. This would be an invalid inference from the premise that psychological capacities are unnecessary to the conclusion that they are also insufficient.

But there is a more charitable, and more interesting, explanation. According to this explanation Olson's wholly non-psychological theory of animal persistence conditions flows coherently from an influential vision of the fundamental metaphysical nature of an organism. Here is Olson:

> Organisms differ from other material things by having *lives*. By a life I mean more or less what Locke meant (1975: 330–331): a self-organizing biological event that maintains the organism's complex internal structure. The materials that organisms are made up of are intrinsically unstable and must therefore be constantly repaired and renewed, or else the organism dies and its remains decay. An organism must constantly take in new particles, reconfigure and assimilate them into its living fabric, and expel those that are no longer useful to it. An organism's life enables it to persist and retain its characteristic structure despite constant material turnover. … Organisms have parts: vast numbers of them. A thing is alive in the biological sense by virtue of a vastly complex array of biochemical processes, and the particles caught up in these processes are parts of the organism. (2007: 28)[13]

On this view an organism is most fundamentally characterized as a certain kind of composite object. An organism is something composed of a plurality of small parts standing in a characteristic multigrade relation, the relation of being collectively caught up in a self-organizing event. Readers of van Inwagen 1990 will recognize this "micro-collective" vision of an organism. It features in his answer to the Special Composition Question, which asks under what conditions a plurality of objects compose a further object. Van Inwagen answers that they compose a further object just in case they are caught up in a self-maintaining biological event: "an unimaginably complex metabolic storm of atoms" (1990: 87).

The micro-collective vision contrasts with the conception of macroscopic continuants applied here, according to which a human organism is fundamentally a locus of macroscopic activity characteristic of its kind. It might be thought that this is a mere difference of emphasis. After all, no one will deny that tiny parts of a human organism are normally caught up in global homeostatic events; and no one will deny

13. Cf. Olson 1997: ch 6 for further elaboration of this conception of an organism.

that a human organism characteristically walks, talks, breathes, fights infection, and the rest.

The difference of substance emerges in the remnant cerebrum case. The micro-collective vision of the fundamental nature of an organism provides a theoretical reason to suppose that in the remnant cerebrum case a human organism is not preserved. In this situation the remnant needs complex external maintenance in order to regulate its global temperature and nutrition. External maintenance is needed to prevent its particles from losing their complex collective organization. So it is not an entity whose particles are caught up in a self-maintaining biological event of the usual kind. According to the micro-collective view, then, the entity is not an organism.[14]

We can now discern the more principled reason for Olson to select the capacities realized in the autonomic "life-support system" of a human organism as metaphysically necessary for its persistence. These capacities direct the self-maintaining collective metabolic activity of its small parts. If this self-maintaining collective activity of parts is fundamental to its very nature as an organism, then no organism could possibly lose its life-support capacities.

As we have seen, the "macroscopic" conception has the contrary consequence that the human organism persists in the remnant case because a massive number of capacities for activity characteristic of the human organism kind are preserved. It sees no theoretical reason to make life-support capacities in particular metaphysically necessary.

Having seen how this disagreement about persistence conditions flows from these contrasting visions of the fundamental nature of an organism, the question arises whether there is any way to adjudicate between these visions.

There are in fact a number of reasons to prefer the macroscopic view adopted here. A preliminary point is this: the notion of an organism as fundamentally that which is composed when a plurality of small parts meet a certain collective condition is a notion that emerged from van Inwagen's attempt to give a formally acceptable answer to his Special Composition Question. But, outside of his particular project, it is a far more natural starting point to permit the fundamental nature of an individual to be characterized in terms of the activity of the individual itself, rather than the collective activity of its tiny parts. After all, why, in the first place, are we inclined to accept the existence of the individual over and above the existence of a plurality of tiny inter-related parts if not because we recognize the activity of the whole individual itself?

In addition to its dubious initial motivation, the micro-collective vision faces two problems characteristic of micro-reductionism in other areas. First there is a problem of *multiple realization*. It is plausible that a cat could be plunged suddenly into deep freeze, and then later revived, so as to resume its distinctive feline activities. But there is no self-maintaining metabolic storm during the freeze. A fortiori, there is no composite of a plurality of particles caught up in a self-maintaining metabolic storm during the freeze. But it is implausible to suppose that there is no organism during the freeze. The natural, and better, way to think about the case is that the preservation of a sufficiency of cat-characteristic capacities is realized during the freeze — not in the usual way, by the continuation of a metabolic storm, but instead by thermodynamic stasis. What matters for persistence is that sufficient kind-characteristic capacities for whole-organism activity are preserved. The specific underlying thermo-chemical realization of this preservation may vary from case to case.

Unger's (1980) Problem of the Many is another well-known difficulty for any attempt to characterize a macroscopic continuant "from the bottom up", as most fundamentally a composite of microscopic parts interrelated in a certain way. In the vicinity of a human organism will be many slightly different but massively overlapping pluralities of small particles collectively related by the relevant kind of metabolic activity. For a theorist who holds that a human organism is most fundamentally a composite of such an inter-related plurality, it is very

14. Olson explicitly appeals to the absence of the proper relation among the small parts of the cerebrum: "the detached cerebrum … is not an animal because its parts do not coordinate their activities in the way that the parts of an organism coordinate theirs. Its cells don't work together as a self-sustaining unit" (1997: 115).

difficult to avoid the absurd conclusion that there are many massively overlapping human organisms in one's vicinity.

This is not the place for a survey of responses to the Problem of the Many.[15] But it is important to note that there is a way forward for the alternative conception of a macroscopic continuant as most fundamentally a locus of kind-characteristic macroscopic activity.[16] On this conception, an object's path of macroscopic activity has explanatory priority over its constitution by small particles. A plurality of small particles constitutes a macroscopic continuant at a time *because* its path of macroscopic activity passes through the plurality at that time. Given the "coarseness" of a path of macroscopic activity, a single path may pass through many slightly different pluralities of particles at a time. So it follows that a single macroscopic continuant may be constituted by many slightly different pluralities of particles. Given this direction of explanation, there is no need to admit many macroscopic continuants corresponding to the many pluralities.

In response to these general problems for a micro-collective conception of the fundamental nature of a macroscopic continuant, it might be pointed out that the thesis that the capacity for self-maintenance is necessary for human organism persistence is logically detachable from the micro-collective conception. One can understand the activity of self-maintenance as something done by the organism as a whole, and agree that it is not straightforwardly constructible from the collective activity of small parts.

But is there any good reason to suppose that preservation of this particular whole-organism capacity is metaphysically necessary for the persistence of a human organism? Is there any good reason to suppose that the loss of the capacity for self-maintenance could not be compensated by the preservation of other kind-characteristic capacities?

Perhaps it is thought that empirical science has revealed self-maintenance to be the essence of life. It has not. The existence of obligate symbionts — such as bacteria in the gut that cannot survive without their hosts — demonstrate the general risk of betting on any such single essence of life.[17]

In the case of human organisms in particular, one might attempt to defend the necessity of self-maintenance on the following grounds: In a human organism the autonomic life-support capacities obviously have a special *causal* role. Due to the thermodynamic instability of such a complex organic structure, the loss of these capacities will very rapidly lead to the loss of almost every other capacity, including psychological capacities.[18] Psychological capacities, in contrast, do not have this special causal role. If the organism loses only its psychological capacities, then it can retain its structure and many other capacities for a much longer period, as demonstrated by the human vegetable case.

But it would be a non sequitur to infer from the premise that a capacity has this special causal role to the conclusion that the capacity is metaphysically necessary for persistence. Here is an analogy to make the point: Imagine a kind of fragile entity which spends its life balancing on a network of wobbly tight-ropes high over jagged rocks that would smash it to pieces should it fall. Just as a complex organic life form is thermodynamically unstable, needing constantly to self-adjust and work to fight its tendency to fall from a state of low entropy to a state of high entropy, so this kind of creature is in a gravitationally precarious situation, needing constantly to self-adjust and work against its tendency to be destroyed by a fall from a state of high gravitational potential to a state of low gravitational potential. So the capacity to keep balanced has a causally central role for an entity of this kind. If

15. See Weatherson 2009 for a survey.

16. The following general approach to the Problem of the Many is developed in explicit detail in Jones 2015.

17. For example, studies show that parasites of genus *Mycoplasma* depend upon their hosts for amino-acid and co-factor biosynthesis, and fatty-acid metabolism. See Dupré and O'Malley 2009 for references to relevant empirical studies.

18. A few characteristic brute material capacities may be preserved for rather longer, through the early stages of decomposition: humanoid space-filling, mattress-compressing.... Would these few capacities be sufficient for the persistence of a diminished organism? Would a few grains of sand be sufficient for a small heap? It seems to be a borderline case.

it were to lose that specific self-regulatory capacity, then very soon thereafter it would lose all of its other capacities for characteristic activity. It would plunge to its annihilation.

But it would be a mistake to infer that the entity's loss of its sense of balance *constitutes* its destruction. It is obviously possible for the entity to persist for a brief time as its plunges to earth. This is not just intuitively obvious. It is theoretically explicable on the framework adopted here: a sufficient number of other kind-characteristic capacities may be preserved for a brief time, compensating for the loss of the specific capacity to maintain balance. A rapid targeted intervention could save the entity. It could, as seems plausible, be caught on the way down.

The situation is exactly parallel for a human organism that loses its capacity for metabolic self-maintenance. With some very quick external intervention, it could in principle be caught on its plunge to thermodynamic annihilation. This is what happens to the remnant cerebrum in a vat. In this situation, external intervention saves it from losing a large number of human-organism-characteristic capacities, despite the loss of the capacity to keep metabolically balanced without assistance.

So, as it seems, there is no sound theoretical motivation for metaphysically fetishizing the autonomic self-regulatory capacities realized lower in the nervous system over and above the richer capacities realized in the cerebrum. We are thus free to take the theoretically more elegant view that a human organism can persist in virtue of the preservation of a sufficient number of human-organism-characteristic capacities, without prejudice as to which capacities must be preserved.

7. The Cutting and Grafting of Organisms

The final major area of concern about the present proposal to make the animalist thesis (A) compatible with the intuitive thesis (B) relates to the separation-and-attachment case. Recall that (B) conjoins the following theses, both compelling:

(B1) We would go with the cerebrum in a remnant case.

(B2) We would go with the cerebrum in a separation-and-attachment case.

We have seen how (A) strongly supports (B1). But (B2) concerns a more complex case, in which a healthy and whole human organism is not whittled down leaving a cerebrum in a vat, but instead has its cerebrum carefully separated away. This leaves what appears to be a living human organism in a vegetative state. Nearby is another living human organism in a vegetative state, missing a cerebrum. The cerebrum separated from the original organism is then carefully grafted into the skull of this ready organism. Soon enough the specific psychological capacities of the original human person will be expressed where the cerebrum was grafted together with the waiting organism.

It is, on the face of it, much harder to see how (A) could be consistent with the intuitive verdict (B2) that one of us would go with the cerebrum in the separation-and-attachment case. First consider the separation phase. If (A) we are human organisms, and (B2) we go with the cerebrum, then what about the human organism that is left behind in a vegetative state? Where did it come from? It cannot be supposed that it existed before the separation event. For in that case one should have to suppose that there were two human organisms at one's location before the separation event. This seems absurd. On the other hand, if the organism did not exist before the operation, then it must have been created by the removal of the cerebrum. But it sounds bizarre to say that removing an organ from a human organism could bring a new human organism into existence.

Parallel worries afflict the attachment phase of the case. If (A) we are human organisms, and (B2) we go with the cerebrum, then what happens to the recipient vegetative human organism? Is it still present at the end of the process? If so, then there must be two human organisms at the end of the process. But that sounds very strange. There would appear to be only a single human organism present, with a new organ. On the other hand, if we say that the recipient organism

is gone by the end of the process, then we are committed to the apparently bizarre conclusion that implanting a new organ can destroy a human organism.[19]

In order to see the right way through these questions, we can begin by noting that the imagery of organ removal is misleading according to the picture developed in this paper so far. We have seen that the smaller object resulting from the separation event preserves sufficient human-organism-characteristic capacities to count as a locus of activity of that kind: it is a human organism. So the separation event is more accurately viewed as a *fission* event: it is an event in which human-animal-characteristic activity divides into two paths. There are two human organisms at the end of the fission event: one preserving the diverse and distinctive psychological capacities preserved by the cosmically complex cerebrum — the other preserving the autonomic capacities realized by the simpler remaining fragment of the nervous system. Moreover, given this asymmetry in the number of capacities preserved, it is plausible to regard this as a case of *asymmetric* fission. So the original human organism goes with the cerebrum. The human organism in a vegetative state is the inferior "branch-line" of the fission. It is a new offshoot organism.

This verdict may seem surprising. Biological processes in the bulk of the tissue of the initially undivided human organism may carry on perfectly undisturbed in the human vegetable left behind by the cerebrum. So how could this vegetative organism possibly be a newly created organism?

But this situation is metaphysically no different from actual cases of *plant cutting*. This is a horticultural technique of propagating plants by asexual means. A part of a parent organism is cut off and placed into, say, a jar of water. Suitably tended and nourished, the entity in the jar can come to manifest whole-plant-characteristic activity: it can

19. Olson (1997: 111–123) presses objections of this kind against an anticipated proposal to combine the animalist claim that we are fundamentally human animals with the claim that human animals have Lockean persistence conditions.

sprout roots of its own and flower. A new living organism has been created — a genetic clone of the parent. Yet biological processes that were going on in the tissue of the parent organism may well have carried on undisturbed in the tissue of the daughter plant.

Plant cutting is precisely a case of asymmetric fission of organisms. Dominance in asymmetric fission of organisms can march in step with preponderance of biomass — but it need not. Suppose one takes a cutting from a banana plant with a giant leaf, much larger in mass than its remaining root and stem structure. One nourishes the detached leaf, and whole-plant activity begins to manifest. It remains plausible that this larger thing is a new daughter plant, and the parent plant has the remaining root and stem structure. Why? At the fission event a greater range of capacities for kind-characteristic activity is preserved in the root and stem structure than in the relatively simple leaf. In a focally realized organism, preponderance of biomass is an unreliable guide to identification of the dominant locus of kind-characteristic activity.

The same is true of human organisms. By separating the rest of the organism away from the cerebrum, one in effect takes a large living cutting from the parent organism, a parent organism which is now much less massive but nevertheless dominant in virtue of realizing the greater range of kind-characteristic capacities. It may be distracting that it is the cutting which better preserves the original gross form and appearance of the parent organism, but, as has already been pointed out, these superficial continuities have no overriding significance for the persistence of focally realized continuants.

But still, one might be puzzled. It has been agreed — plausibly enough — that an individual human organism could persist with its cerebrum rubbed away. But such a human vegetable could be an exact duplicate of the human vegetable left behind after the cerebrum separation event. How can it be held that the human organism would persist as the vegetable in the first case, but not as the vegetable in the second? How can this be coherent?

This should be no more or less puzzling than perfectly familiar pairs of cases. A bar of soap can be rubbed down to 1/5 of its original

size. But if instead a bar of soap has 1/5 snipped off directly, then the bar of soap shrinks down to 4/5 of its size, despite the fact that the smaller cutting might intrinsically match the reduced entity in the first case. These are duplicates with quite different origins. The first is a large bar of soap shrunk down. The second is a new chunk of soap created by taking a cutting from a parent bar of soap.

In the case of a simple homogenous material concretion like a bar of soap, dominance in fission really is measured by preponderance of mass. This difference with human organism fission is metaphysically entirely superficial, but it is likely to have made the right theoretical viewpoint here difficult to spot. From the point of view of preservation of human organism capacities, a large vegetative organism is a "smaller" fragment than the cerebrum. A human organism can be rubbed down to such a fragment, and such a fragment can be a new cutting taken from a parent organism.

It may be a helpful exercise to imagine an anatomical projection of the human organism on which the spatial volume of a part is proportional to the number of human-organism-characteristic capacities realized in the part. The projected image can then be used to judge dominance in fission by crude means of relative size. It is plausible that, for a developed human organism, the cerebrum-image in this projection would be "unfolded" to an enormous extent.[20]

What about the attachment phase of the Brown-Brownson case? The attachment phase is also modeled by actual horticultural techniques. It is metaphysically no different from certain cases of *plant grafting*. An inferior plant can be grafted onto a superior plant. Eventually the parts of the inferior plant are absorbed into the activity of the superior plant, and the inferior plant is no more. This is a case of asymmetric *fusion* of organisms. Again, there is no reason to assume that dominance in fusion should march in step with preponderance of biomass. A large but simple plant could be grafted onto a small but more richly endowed plant, so that, by the end of the process, the activity prevalently expressed is the activity characteristic of the smaller plant.

The imagery of implanting an organ into a human organism is thus misleading. The attachment phase of the Brown-Brownson-type case is a fusion of two loci of human organism activity. It is the grafting of a large human organism onto a small human organism. Moreover, it is an asymmetric fusion in which, again, capacity-dominance inverts preponderance of mass. In virtue of the great diversity of specific capacities realized by the cosmically complex cerebrum, as compared to those realized by the simpler lower nervous system, it is plausible that the more massive human organism will be absorbed into the dominant locus of activity of the less massive organism.[21]

So, far from creating trouble for animalism, the intuitive Brown-Brownson verdict (B2) is in fact strongly supported by the thesis that we are fundamentally human organisms: it is theoretically plausible that a human organism would indeed "go with the cerebrum" in the separation-and-attachment case. First, a large living cutting is taken from the human organism. Second, the original, now much smaller, human organism has a large inferior organism grafted onto it.

8. Conclusion

We have already seen how (A) strongly supports the remnant verdict (B1). So we can now draw the advertised overall conclusion: (A)

20. For simplicity, this discussion of fission ignores the nice question of whether the fission of paths of kind-characteristic activity must happen *immediately* upon spatial separation of cerebrum and "cerebrum-complement". As with the disassembled watch, one might think that the improbable matching of the just-separated parts suffices for a single, but spatially forked, path of preserved human organism capacities. Consider the unlikely capacities for immunological co-operation between the two parts. Consider the many capacities for bodily action preserved by the extremely specific harmony between the body-schema of the motor cortex and the physical structure of the cerebrum-complement. The "sticking back together" intervention needed to trigger these activities is relatively simple compared to delicately organized matching of the two parts of the scattered object.

21. Again it should not be assumed that the fusion of paths of human-organism-characteristic activity happens *immediately* upon physical attachment. There may be a "settling in" period during which we simply have two human organisms stuck together.

strongly supports (B). I shall close by addressing a general worry about the argument developed in this paper.

What exactly, it might be asked, justifies its key claims, that the remnant cerebrum in a vat preserves "sufficient" capacities for human organism activity, and that the remnant cerebrum is "dominant" in the asymmetric fission and fusion of human organisms? These are convenient claims; but are they really principled? In response to this worry it is sufficient to reiterate theoretical points already emphasized throughout the paper, that psychological capacities are characteristic of the human organism kind, and that the cerebrum preserves a diverse range of specific such capacities in virtue of its incredibly complex structure. It is unmatched in this respect by any other part of the human organism.

But, at this final stage of proceedings, the possibility of a supplementary response becomes visible. This paper has not assumed the animalist thesis (A). It has only argued that (A) strongly supports the intuitive verdicts about our persistence usually thought to be inconsistent with that thesis. But anyone who believes the independently attractive thesis that we are fundamentally biological organisms of a certain kind has at their disposal a further reply to the worry about justifying the claims of sufficiency and dominance.

The supplementary reply is enabled by two plausible general principles. First, one who believes that the *F*s are fundamentally *K*s ought to regard a strongly intuitive positive verdict about the persistence of an *F* as supporting a positive verdict about the persistence of a *K*. For example, anyone who believes that the creatures in a cage are fundamentally field mice ought to regard a strongly intuitive positive verdict about the persistence of one of the creatures in the cage as supporting a positive verdict about the persistence of a field mouse. Likewise, anyone who believes the plausible thesis that we are fundamentally biological organisms of a certain kind ought to regard a strongly intuitive positive verdict about one's persistence as supporting a positive verdict about the persistence of a biological organism of that kind.

The second plausible principle is this: verdicts about the persistence of *K*s in particular cases provide evidential support for claims about which capacities can be sufficient, or dominant, for *K*-persistence. For example, the intuitive verdict that a computer can persist through a loss of its metal casing can be taken as evidence that certain capacities are sufficient for the persistence of a computer.

It follows from these two plausible principles that the animalist is entitled to regard the familiar, strongly intuitive, verdicts about our persistence in the remnant case, and the separation-and-attachment case, as further evidence that the capacities preserved by the cerebrum are sufficient, and dominant, for the persistence of human organisms. There is nothing to prevent an animalist from using intuitive verdicts about our persistence as part of the evidence for claims about what is enough for the persistence of biological organisms of the kind we are.

Of course, this supplementary animalist response to the query would make no sense whatsoever on the common assumption that animalism is inconsistent with the intuitive verdicts. But, as has been argued in this paper, this common assumption does not seem to be true.[22]

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