Twinning, Inorganic Replacement, and the Organism View

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TWINNING, INORGANIC REPLACEMENT, AND THE ORGANISM VIEW

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Abstract

In explicating his version of the Organism View, Eric Olson argues that you begin to exist only after twinning is no longer possible and that you cannot survive a process of inorganic replacement. Assuming the correctness of the Organism View, but *pace* Olson, I argue in this paper that the Organism View does not require that you believe either proposition. The claim I shall make about twinning helps to advance a debate that currently divides defenders of the Organism View, while the claim I shall make about inorganic replacement will help to put the Organism View on a par with its rival views by allowing it to accommodate a plausible intuition that its rivals can accommodate, namely, the intuition that you can survive a process of inorganic replacement. Both claims, I shall also argue, are important for those who are interested in the identity condition of a human organism, even if they do not hold the view that you are essentially an organism.

I. Olson's Organism View

What are you essentially? What does it take for you to persist through time? According to a common theory known as the Organism View, you are essentially an organism.[1]

[1] See, e.g., W. R. Carter, 'Do Zygotes Become People?', Mind 91 (1982): 77-95; Warren Quinn, 'Abortion: Identity and Loss', Philosophy and Public Affairs 13 (1984): 24-54; P. F. Snowdon, 'Personal Identity and

Organisms are beings that have the capacities to carry on certain life processes such as metabolism, growth, assimilation, responsiveness, movement, reproduction, respiration, digestion, absorption, circulation, excretion, differentiation, and so on.[2] According to the Organism View, a being, X, is essentially an organism, if

> a) X begins to exist when the capacity to regulate and coordinate metabolic and other life processes is there; b) X persists as long as there is what may be called 'organismic continuity,' which is the continuing ability to regulate and coordinate metabolic and other life processes;[3] and c) X ceases to exist when the capacity to regulate and coordinate metabolic and other life processes is permanently gone.[4]

Brain Transplants', In Human Beings, D. Cockburn. ed. (Cambridge: Cambridge University Press, 1991), pp. 109-26; Peter van Inwagen, Material Beings (Ithaca, NY: Cornell University Press, 1990); Eric Olson, The Human Animal: Personal Identity without Psychology (New York: Oxford University Press, 1997); S. Matthew Liao, 'The Organism View Defended', The Monist 89, no. 3 (2006): 334-350.

[2] See, e.g., Liao, The Organism View Defended, pp. 336-337; Olson, The Human Animal, pp. 126-131.

[3] The concept of organismic continuity/discontinuity is similar to van Inwagen's discussion of cessation/suspension of life.

[4] The concept 'permanent' is not easy to define. We can avoid some confusion though if we distinguish between a metaphysical and an epistemic understanding of this term. Metaphysically, permanent organismic discontinuity for an organism occurs when in fact the organism will forever not be able to coordinate its life processes. Epistemically though, we can of course be wrong about when this point has occurred for an organism. For a further discussion of this concept, see Lawrence C. Becker, 'Human Being: The Boundaries of the Concept', Philosophy and Public Affairs 4:4 (1975): 334-359.

As an illustration of this view, consider a bacterium, which is typically regarded as essentially an organism. The beginning of a bacterium's existence can be traced to the start of the capacity to regulate and coordinate various life processes such as assimilation, growth, and so on. This is usually a point after binary fission, when a bacterium is capable of independent existence. The bacterium then persists as long as there is the continuing ability to regulate and coordinate metabolic and other life processes. This means that while the bacterium may leak enzymes out of the cell membranes into the environment, as long as the same capacity is keeping the bacterium functioning as an integrated whole, the bacterium persists, since there is organismic continuity. Finally, the bacterium may at some point cease to exist when the capacity to coordinate and regulate various life processes ceases. Cessation can occur, for example, with death. In such a case, there would be permanent organismic discontinuity.

In addition to being able to account for the numerical identity of a bacterium, the Organism View seems also to explain well the numerical identity of many other beings that are non-human. Indeed, it is fairly uncontroversial to hold that plants and lower non-conscious animals are also essentially organisms.[5] That is, we typically do not think that plants and lower non-conscious animals are essentially something-other-than-organisms, or that they stand in certain relations to organisms in the way that, according to some

[5] Some might wonder why I do not use lower conscious animals as examples. The reason is that Peter Unger has argued that our intuition about brain transplantation in the case of human beings should apply to lower conscious animals as well ('The Survival of the Sentient', Philosophical Perspectives 14 (2000)). To avoid presupposing any element of the Psychological View, I therefore use non-conscious animals instead of lower conscious ones.

philosophers, you stand to organisms, that is, one of non-identity.[6] Given that the Organism View explains well the numerical identity of many beings that are non-human, and given that you are not very different from these organisms in that, like them, you too coordinate and regulate various life processes, there is some reason to believe that the Organism View ought also to account for your numerical identity.

For the purpose of this paper, let us assume that the Organism View is the correct view of human numerical identity. Suppose that this is the case. Should you also believe that you begin to exist only after twinning is no longer possible and that you cannot survive a process of inorganic replacement? Eric Olson, a chief advocate of a version of the Organism View, has argued for both propositions. Although Olson's Organism View is not the only Organism View available in the literature, it is one of the most rigorously and effectively defended ones. In claiming that you begin to exist only after twinning is no longer possible, Olson puts himself in the same camp as some other defenders of the Organism View such as Norman Ford, Barry Smith, and Berit Brogaard,[7] but he also puts himself at odds with other defenders of the Organism View such as Gregor Damschen, Alfonso Gomez-Lobo, and Dieter Schoenecker, who hold that the human organism begins to exist even while twinning is still possible.[8] Olson's claim that you

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[6] I thank Eric Olson for this point.

[7] Norman Ford, The Prenatal Person: Ethics from Conception to Birth (Oxford: Blackwell, 2002); Barry Smith and Berit Brogaard, 'Sixteen Days', Journal of Medicine and Philosophy 28, no. 1 (2003): 45-78.

[8] G. Damschen, A. Gomez-Lobo, and D. Schoenecker, 'Sixteen Days? A Reply to B. Smith and B. Brogaard on the Beginning of Human Individuals', Journal of Medicine and Philosophy 31 (2006): 165-75; Patrick Lee, 'The Pro-Life Argument Form Substantial Identity: A Defence', Bioethics 18, no. 3 (2004): 249-63.

cannot survive a process of inorganic replacement is one that can also be found in van Inwagen's work.[9] But this claim also puts Olson's Organism View in conflict with some of its revival views such as the Psychological View and some versions of Four-Dimensionalism, on which you would be able to survive such a process of inorganic replacement. In this paper, assuming the correctness of the Organism View, but *pace* Oslon, I shall argue that the Organism View does not require that you believe either proposition. I shall also argue that the points I shall be making are important for those who are interested in the identity condition of a human organism, even if they do not hold the view that you are essentially an organism.

II. Could You Have Existed While Twinning Was Still Possible?

To advance the idea that you begin to exist only after twinning is no longer possible, Olson says the following:

> You began to exist when the human animal that you are came into being. But that organism was probably never a fertilized ovum . . . when the fertilized egg cleaves into two, then four, then eight cells, embryologists tell us, it does not become a two-celled, a four-celled, and then an eight-celled organism. Those cells adhere together only loosely, and their growth and other activities are not coordinated in the way that the activities of an organism's cells are coordinated. Until the end of the second week after fertilization, the cells are all alike, or totipotent: they do not have specialized tasks, and each can be the ancestor of any

[9] van Inwagen, Material Beings, op. cit.

> human cell. . . Many embryologists believe that a genuine human embryo—the multicellular organism that later becomes a fetus, an infant, and an adult—comes into being about sixteen days after fertilization . . . At this point, twinning is no longer possible.[10]

As one can see, Olson's claim that you begin to exist only after twinning is no longer possible relies in part on scientific evidence. To address his claim effectively, I shall be doing the same. Several lines of arguments can be discerned in the passage above. The first is as follows: The fact that something has the potential to undergo twinning and give rise to two new beings means that there is not actually a unique being there.[11] Since you are a unique being, you could not have existed while twinning was still possible.

The second argument is that the cells of the embryo that exist while twinning is still possible are totipotent. The totipotency of these cells means that a distinct individual has not arrived on the scene, because any of these cells could give rise to a distinct individual. If there is no distinct individual, then, so the argument goes, one cannot be numerically identical to the embryo at this stage. As Olson says, 'Until the end of the second week after fertilization, the cells are all alike, or totipotent: they do not have specialized tasks, and each can be the ancestor of any human cell.'

Finally, according to the third argument, the embryonic cells that exist while twinning is still possible are not sufficiently coordinated.[12] The fact that they are not

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[10] Olson, The Human Animal, pp. 90-91.

[11] See, e.g., Lynne Rudder Baker, The Metaphysics of Everyday Life: An Essay in Practical Realism (Cambridge: Cambridge University Press, 2007), pp. 72-73, who echoes this point.

[12] Smith and Brogaard, 'Sixteen Days,' p. 60.

sufficiently coordinated means, according to this argument, that there is not just one single organism there at this stage, but many organisms loosely linked. As Olson says, 'Those cells adhere together only loosely, and their growth and other activities are not coordinated in the way that the activities of an organism's cells are coordinated.' Indeed, *a la* van Inwagen, it might be pointed out that dancers in an ensemble also coordinate their movements and communicate with each other.[13] Yet, they are not a giant organism. Also, since the early embryo is not initially growing larger – instead, each cell is smaller than its ancestor, it might be denied there is any coordination of life processes such as metabolism, assimilation, growth, responsiveness, respiration, digestion, absorption, and so on, in the early embryo. If there were many organisms at this stage, then, so the argument goes, there cannot be a distinct individual to whom one can be numerically identical.

The first argument is however questionable.[14] A living amoeba has the potential to 'twin' and give rise to two or more amoebae anytime. It would not follow that there was not a unique amoeba before it split into two or more amoebae. Or, in the case of most plants, one can use parts of the plant to create an entirely new plant. Again, it would not follow that there was not a distinct plant before such a procedure.

The second argument is also problematic. For one thing, the cells of the human embryo are only totipotent for the first few days, not, as Olson says, for the first two weeks. Given this, if totipotency is the reason why human beings are not numerically

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[13] van Inwagen's example is a group of cheerleaders coordinating to form a pyramid (Material Beings, op. cit).

[14] See also Damschen, Gomez-Lobo, and Schoenecker, 'Sixteen Days?,' op. cit.

identical to an embryo, the duration of when human beings are not numerically identical to an embryo should be shorter.

More importantly, the cells of most forms of plants are totipotent throughout their lives. Indeed, in the case of most plants, one can use parts of the plant to create an entirely new plant. Does this mean that therefore there is never a distinct plant? Clearly not. We can easily distinguish between one plant and another, even though the cells of most plants are totipotent throughout their lives. If this is right, the fact that the early embryonic cells are totipotent does not undermine the possibility that a distinct individual could already be present even while twinning is still possible.

In response to the third argument, there is scientific evidence that shows that when the sperm penetrates the egg, the point at which the penetration takes place seems to determine which part of the zygote will develop into the embryoblast and which part into the trophoblast.[15] This suggests that there is some kind of exchange of information and coordination within the single-cell zygote, the multiple-cell zygote, and subsequently within the morula and the blastocyst.

Here are additional considerations in favor of the idea that the embryonic cells are sufficiently coordinated even while twinning is still possible. First, as a matter of fact, there are thousands of cells by the time a blastula is formed around the nine-day stage, and certainly many more by the sixteen-day stage. Though by no means metaphysically impossible, it seems highly suspect that these thousands of cells would all be distinct and

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[15] Damschen, Gomez-Lobo, and Schoenecker, 'Sixteen Days?,' op. cit. See, e.g., R. L. Gardner, 'Specification of Embryonic Axes Beings before Cleavage in Normal Mouse Development', Development 128 (2001): 839-47.

separate organisms; that they would not be sufficiently coordinated; and that at the sixteen-day stage, all of them would all of the sudden become sufficiently coordinated to compose a single organism.

Secondly, while the dancers in van Inwagen's analogy are coordinating their movements, they are not coordinating various life processes. If so, this type of example would not be analogous to the case at issue. Instead, a better analogy might be to compare the coordination of the daughter entities of a bacterium with that of the daughter entities of an embryo. In such a comparison, it seems that the early embryonic cells could be coordinating life processes with one another, unlike the daughter entities of a bacterium. For example, while the daughter entities of a bacterium could and often would just wander off, this is not so with the daughter entities of an embryo.

In fact, there is ample scientific evidence that the daughter entities of an embryo do communicate with one another to coordinate further development. For example, if one of the cells in the embryo were removed, the other cells would coordinate to replace the cell so that further development would continue. Also, studies have shown that the various totipotent cells also coordinate with one another at very early stages. In particular, after the single zygote divides into two cells, one of these cells will divide first, giving rise to three cells, while the other one will 'wait.' After some time, the other cell will divide, making it four cells, and then eight cells, etc.[16] This suggests that there is coordination among the cells even at such an early stage. Moreover, in a number of experiments with mouse embryos, in which the first two cells of the zygote were painted,

[16] W. Larsen, Human Embryology (New York: Churchill Livingstone, 1997), p. 17; B. Carlson, Human Embryology and Developmental Biology (St. Louis, MO: Mosby, 1994), p. 33.

one red and one blue, and their development to the blastocyst stage was traced, it was found that the inner mass cells consistently came from one of the cells, while the trophectoderm and other supporting tissues such as the placenta came from the other cell.[17] This suggests that the cells at the two-cell stage are already predisposed to follow a specific developmental path. If they were not, the inner mass cells and the trophectoderm and the other supporting tissues should be randomly made up of cells from both. Furthermore, other studies have shown that the cells at the four-cell stage are also predisposed to follow certain developmental paths.[18] In particular, it has been found that one of the four cells appears to be predisposed to contribute more than the other three to the link between the mother and the embryo proper, rather than the embryo itself, that is, to form the cells that make up the placenta. In the experiment, four embryos at the four-cell stage were obtained, and each cell in each embryo was labeled A, B, C or D and then separated and blended to create four new embryos, each consisting of only one kind of cell, all A, all B, all C or all D. If all the cells were truly similar, it should be the case that all would have the same potential to develop into a mouse. However, this was not the finding. Two types developed perfectly, one showed developmental abnormalities and one failed to develop at all. The researchers hypothesize that the last group might be made of cells destined to form supporting tissues such as the placenta. If they are right,

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[17] K. Piotrowska, F. Wianny, R. A. Pedersen, and M. Zernicka-Goetz, 'Blastomeres Arising from the First Cleavage Division Have Distinguishable Fates in Normal Mouse Development', Development 128, no. 19 (2001): 3739-48. See also K. Deb, Sivaguru, M., Yong, H. Y. and R. M. Roberts, 'Cdx2 Gene Expression and Trophectoderm Lineage Specification in Mouse Embryos', Science 311 (2006): 992-996.

[18] K. Piotrowska-Nitsche, A. Perea-Gomez, S. Haraguchi, and M. Zernicka-Goetz, 'Four-Cell Stage Mouse Blastomeres Have Different Developmental Properties', Development 132, no. 3 (2005): 479-90.

this would lend further evidence to the claim that the cells from an early embryo are already predisposed towards certain developmental paths, and would suggest that there are already significant coordination efforts at the very early stages of an embryo.

Thirdly, regarding the point that the early embryo is not initially growing larger, it is helpful to point out that while growth sometimes involves increasing cell size, this is not the only way by which growth can take place. Growth can also involve increasing cell numbers. To grow by increasing cell numbers, the embryo must coordinate various life processes such as undergo mitosis, which involves duplicating genetic information, and assimilating and metabolizing necessary material. Also, there is an obvious biological explanation as to why the embryo would grow initially by increasing cell numbers. The ovum, and therefore the zygote, is a very large cell, much larger than typical somatic cells. The reduction in cell size therefore produces cells that are closer to the size typical of body cells. If all of this is right, there are reasons to be skeptical of the idea that there is not sufficient coordination among the cells prior to twinning such that a distinct individual could not possibly have already existed.

Here it might be asked, when do you begin to exist then, if you could have existed while twinning was still possible? According to the Organism View, you begin to exist when the capacity to regulate and coordinate metabolic and other life processes is there. Exactly when this occurs is a difficult question, and we need not settle this debate here, since what is important for our purpose is to raise the possibility that you could have existed while twinning was still possible. This said, here is a possible answer. The scientific evidence presented earlier suggests that the capacity to regulate the various life processes begins already at the single-cell embryo stage, when the single-cell embryo

coordinates division and growth to create a more specialized individual. So, one possible answer is that many of us begin to exist as single-cell embryos.[19] However, the possibility of twinning suggests that some of us might have begun our existence somewhat later, namely, after twinning has occurred. Here it is useful to distinguish two kinds of twinning. Twinning can take place through *budding*, as for example, when a blastomere is taken out of the embryo and implanted elsewhere; or through *fission*, as for example when an embryo divides into two equal parts, as in the case of monozygotic twinning. If the twinning is the result of budding in which the original embryo is left largely intact and a smaller embryo is created, the original embryo could have continued to exist, if there was organismic continuity. The smaller embryo would have begun its existence when the budding process had taken place. In the case of twinning through fission, the resulting twins may have begun their existence after the process of twinning occurred. In particular, the twinning process may have caused permanent organismic discontinuity to the original embryo such that it ceased to exist and two new embryos with two new capacities for coordinating various life processes were created.

In any case, while actual twinning may mean that some of us do not begin to exist until after twinning has occurred, if the above arguments are persuasive, then, *pace* Olson, as well as Ford, Smith, Brogaard and others, there are reasons to believe that you could have existed even when twinning was still possible.

III. Can the Human Organism Survive a Process of Inorganic Replacement?

[19] For a defense of this as the starting point of our existence, see, e.g., Damschen, Gomez-Lobo, and Schoenecker, 'Sixteen Days?,' op. cit.

The idea that you can survive a process of inorganic replacement is usually held to be a problem for the Organism View, because there is an assumption that the organism cannot survive a process of inorganic replacement without ceasing to be an organism. Indeed, Peter Unger considers this possibility a refutation of David Wiggins' animalism.[20] As we shall see, Olson is troubled by this objection because he also shares the assumption that the organism cannot survive a process of inorganic replacement without ceasing to be an organism. And, Olson ends up biting the bullet that you cannot survive a process of inorganic replacement on the Organism View. I think Olson has underappreciated the resources available for the Organism View. I shall now argue that the assumption that the organism cannot survive a process of inorganic replacement without ceasing to be an organism is false, and that in fact, even on the Organism View, an organism can survive a process of inorganic replacement. This is good news for the Organism View.

Here it may be worth noting that the point I shall be making is not the 'old' point that *you* can survive a process of inorganic replacement. Many views that compete with the Organism View have already made this point. Nor is it the point that an organism can survive a process of inorganic replacement even after ceasing to be an organism – akin to the idea that a student can survive even after ceasing to be a student. Such a point would not be a defense of the Organism View, since on the Organism View, you are *essentially* an organism. Rather, the 'new' point I shall be making is that an organism can survive the process of inorganic replacement *without ceasing to be an organism*. Of course, once my point is granted, and if you also hold the Organism View that *you* are essentially an

[20] Peter Unger, Identity, Consciousness, and Value (Oxford: Oxford University Press, 1990); David Wiggins, Sameness and Substance (Oxford: Basil Blackwell, 1980).

organism, then it would follow that *you* can survive a process of inorganic replacement. My emphasis here though is on the organism's, rather than on your, surviving the replacement process.

Olson is led to the conclusion that you cannot survive a process of inorganic replacement on the Organism View by the following thought experiment:

> Imagine that your brainstem is replaced by an inorganic substitute gradually, bit by bit, rather than all at once . . . there is never a period when your life-sustaining functions are left without an organ to coordinate them, or when your cerebrum is not aroused and activated in the normal way by the brainstem. As a result, there need be no interruption in consciousness throughout the operation (suppose the surgeons use only a local anaesthetic). . . . The result would be a rational, conscious being with your mind. Isn't it obvious that *you* would be that being? My view, however, entails that you could not survive this . . . For something with an inorganic brainstem, I argued, could not be an animal at all.[21]

Here it is useful to explain that for Olson (and for van Inwagen as well), the human brainstem is the control center of the human organism. So, a human organism would go out of existence the moment the human being's brainstem ceases to function. As Olson says,

[21] Olson, The Human Animal, pp. 141-142.

> your brainstem, as the organ that is chiefly responsible for directing your life-sustaining functions, is essential to you, for without it there is no Lockean life and no living human organism at all.[22]

For the purpose of this paper, let us grant that the brainstem is the control center of the human organism.[23] Olson believes though that even when you remain conscious throughout the process of gradually replacing your brainstem with an inorganic substitute, and even if 'there is never a period when your life-sustaining functions are left without an organ to coordinate them, or when your cerebrum is not aroused and activated in the normal way by the brainstem,' you would not survive such a replacement process. The resulting inorganic being, that is, the resulting non-carbon-based life form – who, in Olson's words, would be 'a rational, conscious being with your mind' – would not be you.

As I mentioned earlier, on many views that compete with the Organism View, you would be able to survive this inorganic replacement process. For example, on the Psychological View, according to which some kind of psychological continuity (e.g. mental contents or the bare capacity for consciousness) is required for human numerical identity, you would be able to survive such a process because psychological continuity

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[22] Olson, The Human Animal, pp. 140.

[23] Alan Shewmon has argued that the brainstem has merely a regulative role that presupposes the integration characteristics of life rather than constitutes it ('The Brain and Somatic Integration: Insights into the Standard Biological Rationale for Equating Brain Death with Death', Journal of Medicine and Philosophy 26, no. 5 (2001): 457-78).

would be maintained during the process.[24] Or, on some versions of Four-Dimensionalism, according to which you are made of temporal parts, it would not be difficult to argue that the inorganic being is one of your temporal parts.[25]

Also, intuitively, it does seem that you could survive this process of inorganic replacement. Certainly, transhumanists who believe that they can survive being uploaded onto a computer would believe that you can survive this process. If so, Olson's conclusion that you could not survive such a replacement process would seem to come at the cost of not being able to accommodate a plausible intuition that the Organism View's rivals can accommodate.

Olson may think that you cannot survive such an inorganic replacement process, because he may think that an organism is essentially a carbon-based life form, and something that is essentially a carbon-based life form cannot become a non-carbon-based life form without ceasing to exist. Olson may think that an organism is essentially a

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[24] See, e.g., H. P. Grice, 'Personal Identity', Mind 50 (1941): 330-50; John Perry, 'Can the Self Divide?' Journal of Philosophy 69 (1972): 463-88; Derek Parfit, Reasons and Persons (Oxford: Oxford University Press, 1984); Robert Nozick, Philosophical Explanations (Cambridge, Mass.: Harvard University Press, 1981); Mark Johnston, 'Human Beings', Journal of Philosophy 84 (1987): 59-83; Harold Noonan, Personal Identity (London: Routledge, 1989); Unger, Identity, Consciousness, and Value, op. cit.; Raymond Martin, Self Concern (Cambridge: Cambridge University Press, 1998); and Jeff McMahan, The Ethics of Killing: Problems at the Margins of Life (Oxford: Oxford University Press, 2002).

[25] See, e.g., Ted Sider, Four-Dimensionalism: An Ontology of Persistence and Time (Oxford: Oxford University Press, 2001); Katherine Hawley, How Things Persist (Oxford: Oxford University Press, 2001); Hud Hudson, A Materialist Metaphysics of the Human Person (Ithaca, NY: Cornell University Press, 2001).

carbon-based life form because organisms that are most familiar to us are all carbon-based life forms.

But while it may be the case that organisms that are most familiar to us are all carbon-based life forms, there is no reason to suppose that all organisms are *necessarily* carbon-based life forms. Strictly speaking, organisms are just entities that have interdependent parts. Given this, it seems that there could be non-carbon-based life forms that have non-carbon-based interdependent parts that are used to regulate and coordinate various life processes such as absorption, assimilation, metabolism, and so on, in order to process certain material into fuel so that they would be able to function. If so, it seems that these non-carbon-based life forms would also qualify as organisms.

If there could be non-carbon-based organisms, then, even on the Organism View, it seems that you could survive the process of gradually replacing your carbon-based brainstem and other organs with an inorganic substitute, as long as functional organismic continuity is maintained throughout this replacement process. After all, biological organisms replace their matter all the time and the reason we do not think that there is a succession of organisms is because of functional organismic continuity. If functional organismic continuity is maintained throughout a replacement process during which all of the carbon-based cells and organs are replaced with non-carbon-based functional equivalents, it seems that at the end of this process, the organism would still remain and remain an organism. This would be so, even on an Organism View, because on an Organism View, an entity persists as long as there is the continuing ability to regulate and coordinate metabolic and other life processes, and, as Olson has stipulated, the entity would maintain this ability during and after the replacement process. If so, even on the

Organism View, you can survive a process of inorganic replacement. After the replacement process, you would just be a non-carbon-based organism rather than a carbon-based one.

To support this idea further, consider a reverse thought experiment: Suppose that in some possible world, you begin your existence as a non-carbon-based life-form. Gradually, all of your non-carbon-based parts are replaced with carbon-based functional equivalents. Suppose that functional organismic continuity is maintained and there is no interruption in consciousness throughout this replacement process. Would the resulting carbon-based life form be you? It seems that it would be. But if you could survive from being a non-carbon based life form to becoming a carbon-based one, it seems that you should also be able to survive the reverse process. If all of this is right, it seems that the Organism View also can accommodate the plausible intuition that you can survive a process of inorganic replacement.

Before concluding, it is worthwhile noting that both the point about twinning and the point about inorganic replacement are important for those who are interested in the identity condition of a human organism, even if they do not hold the view that you are essentially an organism. For instance, Lynne Rudder Baker, who holds a version of the Constitution View, according to which you are not *identical* to an organism but instead you are a human person *constituted* by an organism, agrees with Olson that the human organism begins to exist only after twinning is no longer possible.[26] If I am right though that the human organism can begin to exist even when twinning is still possible, Baker's Constitution View would have to be modified to accommodate this point. Also, given

[26] Baker, The Metaphysics of Everyday Life, pp. 72-73.

that Baker's Constitution View involves the concept of a human organism, the issue of whether a human organism can survive a process of inorganic replacement would also be salient to her view.

IV. Conclusion

In explicating his version of the Organism View, Eric Olson claimed that you begin to exist only after twinning is no longer possible and that you cannot survive a process of inorganic replacement. In this paper, assuming the correctness of the Organism View, but *pace* Olson, I argued that the Organism View does not require that you believe either proposition. While actual twinning may mean that some of us do not begin to exist until after twinning has occurred, I argued that you could have existed even when twinning was still possible because, among other things, there is already a significant amount of coordination among the cells at the early stages of an embryo. Also, I argued that even on the Organism View, you can survive becoming a non-carbon-based life form, as long as organismic continuity is maintained during the replacement process. The first point about twinning helps to advance a debate that has divided defenders of the Organism View, while the second point about inorganic replacement puts the Organism View on a par with its rival views such as the Psychological View and Four-Dimensionalism by allowing it to accommodate a plausible intuition that its rivals can accommodate. I also argued that both points are important for those who are interested in the identity condition

of a human organism, even if they do not hold the view that you are essentially an organism.[27]

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