

CAN LIFE BE A CRITERION OF PERSISTENCE THROUGH TIME? A DISCUSSION OF SOME ONTOLOGICAL THESIS BY PETER VAN INWAGEN

Carlo Conni

Saint Raphael University of Milan, Italy

This work is centered upon some of the principal ontological topics to be found in the major texts by Peter van Inwagen. Almost all his philosophical works fall into about four general areas. 1. The problem of free will, 2. the philosophical theology, 3. the ontology or metaphysics and logic of material beings 4. topics about the philosophy of modality. After some introductory remarks about the ontological general positions assumed by van Inwagen, I'll concentrate myself specifically about his conception of life and identity and the ways of changing and persisting through time of living beings¹.

1. Peter van Inwagen between Analytics and Continentals

In his general analysis concerning analytic contemporary ontology, van Inwagen has distinguished two attitudes or two kinds of ontologists called respectively: A-ontologists and B-ontologists. A-ontologists attempt to say *what there is in the world*, to give a sort of list of all that there is without including anything that does not exist. According to van Inwagen the list must of course comprise very general abstract terms like *artifacts or material things* (tables, statues, houses but also mountains or stones), *material beings* (living beings and simples, the latter entities without parts and indecomposable) or *sets* (abstract compositions of the entities listed above). The most representative A-ontologist is, according to van Inwagen, W.V.O. Quine. A-ontologists as Quine are mainly concerned in an attempt to lay out the extension of being. What van Inwagen calls B-ontologists try first of all to answer to the question: *how are the entities of the world made, or how is the structure of the concrete entities of the world?*²

Van Inwagen admits not to understand much of what B-ontologists write. Their favourite key-terms are tropes, bare particulars, immanent universals, and the entities of the world are generally viewed as bundles of tropes placed in the three spatial dimensions. Nowadays, it is not still clear what is a trope. For instance, I can ask myself: how many tropes of white are in my shirt? Tropes theorists are for instance Peter Simons but also Leibniz was an *ante-litteram* friend of tropes³.

But it is not even more clear what is an immanent universal. If Simons affirms that a chair is composed of a bare particular and assorted tropes, D. M. Armstrong⁴ - a realist philosopher respect to universals - can dispute this characterization saying that a chair is rather a bundle of immanent universals and their disagreement belongs to B-ontology concerning how the world is but not about what there is. But van Inwagen's disagreement with A-ontologists may be the most radical one. Notoriously, the theory of *material things* presented by van Inwagen has seemed to many philosophers a very strange one as the consequence of his denial that *there are* any of the things that the medievals called "substances existing by art" (tables, houses, etc.) or "substances existing by accident" (sticks, stones, severed limbs, etc.). Van Inwagen affirms to agree entirely with Quine about the nature of what there is in the world as material entities placed in a four-dimensional space, and also about the scientific methods one should use in trying to determine what there is, but he disagrees almost entirely about exactly what there is. Van Inwagen agrees about the meta-ontology of Quine that he defines as the highest development of what may be called the "thin" conception of being, as to say, that the concept of being is closely allied with the concept of number. To say that there are things or Xs is to say that the number of Xs is 1 or more and to say nothing more. The methods to investigate the nature of being are, as you know, those of natural sciences and higher order logic that for Quine is nothing but set theory in sheep's clothing, set theory disguised⁵.

The third ontological position or conception of being mentioned by van Inwagen is the philosophical continental tradition saying that ontology is the science of Being as Such. Hermeneutics is an exponent of this conception. A practitioner of the science of being as such is engaged neither to lay out the extension of being nor to answer the question how is the world made. The science of being as such is concerned above all with

the question of the meaning of terms like “there is”, “being” or “exists”. According to van Inwagen the study of the meaning and the nature of being as for instance the Heideggerian ontology, is a meta-ontology rather than a genuine ontology. For Continental philosophers the Being is instead a *thick* concept and they see the thin conception as a loss of the richness of being.

According to van Inwagen the mistake of analytic philosophers is to think that material objects and living beings are entities that can be analyzed at the same degrees as concrete particulars or individuals. The consequence of this standpoint is that the different ontological statuses and the different kinds of identity of these entities are missed.

The so-called thick conception of being of continental philosophy, is founded, according to van Inwagen, on the mistake of transferring what belongs to the “nature” of things to its being. According to van Inwagen, to endorse the continental conception of being is to make the mistake of which Kant accused Descartes, the mistake of treating being as a real predicate. Things have a nature and the mistake consists of transferring the properties belonging to the nature of a table or of a human being or of a universal to the being of the table and so on. This is in short the very idiosyncratic position of van Inwagen between analytics and continentals.

2. Identity and Parts in Material Beings

According to van Inwagen, the problem of the nature of things and living beings is the problem of their specific identity. Do material objects have a specific identity? Do artifacts exist and have a specific identity? Are artifacts real material objects as they are living beings? Can we think that the same principles of identity, the same logical and conceptual strategies and procedures to establish the identity can be applied to material things and living beings ?

We know that the metaphysics of material beings has come to be recognized as one of the most difficult parts of philosophy. In the philosophical panorama of the sixties it seemed to most philosophers that there was nothing but material beings and what was puzzling were rather sense-data, thoughts, universals or elementary particles. But the ontological puzzles the material beings raise are undeniable as the famous of the Ship

of Theseus or more recent but almost equally famous cat Tibbles and his tail Tib. Let's summarize the puzzle of the cat Tibbles in the following way:

Let's suppose that at a certain time t Tibbles is a cat normally endowed with a tail while at the time t_1 Tibbles comes to lose his tail. We call Tib the part of the cat without tail and continue to call Tibbles the cat that at t_1 survives after he has lost his tail. In accordance with the matter of the puzzle at t Tibbles, the cat all whole, and Tib, Tibbles less its tail, are perfectly distinguished since they have different forms and weight, while when Tibbles at t_1 really loses the tail in an accident then Tibbles and Tib become identical:

- (1) Tibbles at $t \neq$ Tib at t
- (2) Tibbles at $t_1 =$ Tib at t_1

But if we assume, following an ontology of the common sense - in other words the naive ontology of our every day life recognizing the principle of temporal continuity - that the cat that has lost the tail would be always the same cat that first we have, we will have then that Tibbles will be the same in the two temporal different moments even if Tibbles at t is a cat with a tail while at t_1 is a cat without tail. The conclusion in (4) it is the passage that here instead we want to put in discussion since Tib in the instant is only a part, or a potential part of the cat, while to t_1 has become indeed an autonomous whole. In any case, if we admit the four passages then for the logical principle of transitivity of the identity which is easily seen from (2) (3) and (4), then it follows (5):

- (3) Tibbles at $t =$ Tibbles at t_1
- (4) Tib at $t =$ Tib at t_1
- (5) Tibbles at $t =$ Tib at t

contradicting clearly the premise in (1) where Tibbles and Tib were separate⁶. Van Inwagen underlines that in this puzzle there is a plain violation of the principle of the transitivity of the identity. The conclusion of this paradox is that an object can be identical to one of its parts. It seems natural to describe this puzzling episode in words that appear to entail that the cat become identical with a former proper part of itself, a violation of the modal principle that a thing and another thing cannot become a thing and itself. According to van Inwagen, if we admit that: "*the northern half of the Eiffel Tower is a concrete material particular in the same sense as that in which the Eiffel Tower itself is a concrete material*

particular"⁷, otherwise if we believe that the parts of the material beings really exist as the object itself, then we should accept a theory in disagreement with the ontology of common sense. We should deny diachronic identity through time and change. The crucial assumption made in the puzzle is that at t Tib really exists in the same sense Tibbles exists at t and Tib at t_1 . This assumption is supported by a theory well known as mereological essentialism in which everytime an object loses a part we will have a new object with a new identity.

The puzzle of Tibbles has shown us a source of problems concerning the ontology of material beings. Here is a list where, according to van Inwagen, every thesis is a possible source of puzzles:

- any region of space that is wholly filled with solid matter is occupied by material objects that exactly fills it.
- any material objects whatever have a mereological sum.
- every material object has all its parts essentially.
- if an object X is the mereological sum of certain objects, the Y s, then the Y s have essentially the property of having X as their sum.
- material objects are extended in time in a way very strongly analogous to the way they are extended in space; objects that are extended in time are composed of temporal parts just as objects that are extended in space are composed of spatial parts.

But the very strong metaphysical assumption that we ordinarily make in our common sense ontology is the transitivity of the identity. The fact that me, you and all material beings can persist through time as the same individuals or things. This metaphysical statements would be, according to van Inwagen, the source of many paradoxes because their combinations lead to some violation of common sense. The combination of these principles together with the puzzles about material objects as the Tibble's one has led many philosophers to propose very different identity theories for material beings. Many philosophers have decided to quit the comfortable principle also called the standard view of numerical identity suggesting at least other three possibilities:

- Identity must be relativized to kinds. It makes no sense to ask whether the object that is the ship X is identical with the object

that is the ship Y because X may be the same ship as Y but not the same aggregate or collection of planks.

- Identity must be relativized to times. X and Y may be two objects at a certain time and later become numerically identical as in the case of the cat Tibbles.
- Identity can also be conceived as a relation that many things can bear to one thing not individually so to speak but collectively. For example certain trees numbering in the hundreds of thousands are identical with the Forest of Arden in Belgium, the legs and the seat of a chair which are five in number are identical with one thing, the chair.

That there are deep metaphysical problems about material objects is evident from the antinomies and paradoxes we have just seen. Van Inwagen has intended to present a theory about the nature of material beings that takes seriously the apparently paradoxical features of their unity and persistence. All paradoxes involve not only material objects but crucially the parts of those material objects. No such paradoxes can be raised in connection with objects that were not composed of parts, then the metaphysically puzzling features of material beings are connected in an essential way with the problem of constitution of objects by their parts.

What is parthood? Answering to this question become more and more important for every ontological theory. Does the word “part” mean the same thing when we speak of parts of cats, parts of tables, parts of poems, parts of games, parts of events? According to van Inwagen, there is one relation called “parthood” whose field includes objects and things like elementary particles which are not clear cases of material objects. But there is another relation called parthood defined on events, another one defined on stories and so on through an indefinitely large class of cases. The analogy between these cases is no doubt, as etymology would suggest, grounded in the idea of “cutting a thing” but *cutting in re* and *cutting in intellectu* are two very different things⁸!

3. The Special Composition Question

The very analysis that, so to speak, has made famous and relevant the ontology of van Inwagen is called “The Special Composition Question”.

The question is the following: “*in what circumstances is a thing a proper part of something?*” But according to van Inwagen this formulation can be misleading because it begins in *medias res*. It is not helpful to ask: in what circumstances is a plank a part of a ship? But rather: in what circumstances do objects compose or form something? We can try to answer these questions in a similar as way to questions: “*when do grains or stones make a heap?*”⁹. And we could answer: when the relevant elements are disposed or configured as a heap, or as a ship. What is crucial are not the plank or the stones, the apparently parts of the ship or of the heap, but the ship/heap form or structure. We are asking a question about the mutual relations that hold among various objects of the same type in virtue of which they are bound together into a specific kind of whole. But it seems that these relations are established independently from the parts or the kind of the parts. Then the stones or the planks are not the very proper parts of the respective wholes. The relevant relations between parts, defining the notion of proper part, are well defined only internally to the entire whole constituted by the material object. We can say that a house is made of bricks but also that the north half and the south half compose the house, and of course there is no inconsistency in saying both that the bricks compose the house and that the two halves compose the house. According to van Inwagen we cannot explain the nature and the identity of a whole from its parts, then the question is: “*when does unity arise out of plurality?*”

According to van Inwagen, any answer concerning contact, fusion, contiguity between material parts does not offer the right solution to the Special Composition Question. I believe we can rightly interpret van Inwagen saying that we cannot move out from parts to wholes without still knowing the identity of the whole, without answering the question: what is that? What is it? We have to know the characteristic or typical relations between its parts. We cannot simply answer the question what are the proper parts of a things as a house without establishing what is a house. Are the elementary particles, the molecules, the bricks, the walls and the doors, the genuine parts of a house? No clear answers to these questions can be offered without leading to paradoxical situations. Here we have a clear application of the classical principle of Quine: no entity without

identity, in a very closed sense we could say: no parts without the identity of the whole.

Van Inwagen argues that there are at least two extreme answer to the Special Composition Question. The first is the nihilist one, the second universalism. The thesis of nihilism is that: *“it is impossible for anyone to admit that something is such that parts or Xs compose it because nothing, any entity in the world, is such that the parts or Xs compose it”*¹⁰.

Nihilist are for instance the physicists who believe physical world consists entirely of quarks, leptons, bosons, etc. The nihilist says that there are no composite material beings, there are only physical simples. A simple is an object without proper part belonging to physical matter. The identity of a thing is strictly equal to the mere composition of the simples. Nihilism corresponds to a form of very extreme nominalism or mereologism.

On the contrary, the thesis of universalism argues that if something exists is such that some Xs compose it. According to universalism for every group of Xs we have different possible sums (sets) one of those necessarily corresponds to the relevant present object. These sums of the Xs exist already before the Xs effectively composing these sums, in the sense that we could at least think or have a grasp of these sums.

For instance a sentence like:

“I exist now”

is denied by the nihilist because we have no I or Self, but it is not denied by the universalist, while the sentences:

“I exist now and I existed one year ago”

“I am an organism (in a biological sense) and I have always been an organism”.

are denied by the universalist because the same parts cannot compose the same objects simultaneously nor succesively. Blocks of matter can set out both the Salisbury cathedral or the Colosseum. The same set of blocks can bring into existence a model of these two buildings. For the universalist “the sum of those blocks” is merely a definite description that needs no temporal qualification. In this respect it is like the proposition “the set containing just exactly those things”. Universalism, according to van Inwagen, is not an answer to the Special Composition Question because it is a principle about summation, not composition. According to van

Inwagen, the universalist denied the existence of an identity through time and also a principle of structural continuity between the slices of time of an individual. J. Locke, for instance, was not a universalist. Van Inwagen defends the thesis that such things as me and you exist and strictly persist through time. In his view human beings provide the clearest examples of material beings that are composed of different parts at different times.

4. The Answer to the Special Composition Question. Simples and Lives

What is the answer to the Special Composition Question? When do we have a real case of parthood? What must be done to cause objects or parts to compose something? When do objects compose or form something? If material things are nothing but aggregates of simples and do not dispose of identities they do not have parts. Van Inwagen believes that the correct answers to these questions are radically different from what most philosophers have supposed. According to van Inwagen, we have real composition only in the case of living beings. His answer to the Special Composition Question is the following:

<The Xs compose y if and only if Y is an organism and the activity of the Xs constitutes the life of Y>.

What is an organism like? The material beings we call organisms have parts and the properties of organism are at least to some extent determined by the properties of their parts. The thesis that the properties of organisms are not wholly determined by the properties of their parts is sometimes called holism but van Inwagen does not take a very clear position about this point, maybe holism is true maybe it isn't. What is important is the fact that we have now a principle establishing that the composition is a matter only of living beings:

<Every physical thing, every material being is either a living organism or a simple>.

But then, what are the medium size objects of our every day life? What then distinguishes mere artifacts or aggregates from real material beings? What is the criterion between these two kinds of entities? According to van Inwagen, we do not need a criterion because we have just lives and simples.

What this principle fundamentally means is still not clear because it can mean that an entity can be a material being either if it has proper parts or not. A real proper part of something is not a thing simply spatially contained inside another bigger thing but it is an entity whose existence, identity or functionality are determined by the whole to which it belongs. It seems that in van Inwagen's approach, to be a proper part means to be an essential proper part or better to be an intrinsic or pregnant proper part. According to van Inwagen, suppose there is something that is neither a simple nor an organism, since it is not a simple it has proper parts. Since it is not an organism it has no proper parts, then our supposition would be impossible. So, in which sense an artifact does not have proper parts? The answer of van Inwagen is because they do not really exist, they are only a form of rearrangement of the furniture of the world, as to say, a rearrangement of simples.

An organism may be thought of as a thing whose intrinsic nature determines how it is to change its parts with the passage of time: *“also a simple fits this abstract characterization of what it is to be an organism. Its intrinsic nature determines that it is always to be composed of the same parts [...] we can say that all physical objects are organism either degenerate or living [...] we might in fact think of simples as degenerate organisms”*¹¹. A table could not be an organism since if they were tables, they could change their parts purely as the result of the application of external forces. Do these assumptions entail that organisms are composed of simples? One might suppose – this is Aristotle's view of the matter – that organisms have no proper parts and that they are composed of absolutely continuous stuff. However, today we know empirically that living organisms are not composed of continuous matter. We could alternatively suppose that organisms have proper parts and that every proper part of an organism is composed of proper parts. For instance a man is composed of cells and the cells in their turn are composed of subcells and so ad infinitum. Again, we can again take it as empirically false.

What can we say more about the notion of “simple”? Van Inwagen believes that: *“the notion of simple is just a functional not a structural or ontological notion. If current physics is right, then it seems fairly clear that the category “simple” comprises quarks, leptons and gauge*

bosons. But perhaps current physics is wrong – or at any rate incomplete”¹².

Let us make a very simple example to better clarify in what sense we have to intend the notion of an inclusion of a part into a material being as a living being. Take a mountain like the Everest. What are the parts that intrinsically belong to the Everest? We can remove many blocks of stones without stopping the Everest to exist. Doing so we can change the shape of Everest without losing it. How many blocks of stones we have to remove to lose the Everest? As you know well, we do not have a univocal answer to these questions because the identity of the Everest is independent from the matter and the shape which effectively compose and characterize it. With the proper name “Everest” we refer to a mountain which is exactly localized by well-defined spatial coordinates while the material and individual identity’s criteria for the Everest are in any case vague.

Concerning organisms we can find out the continuity of the structural and formal conditions of identity of an individual determining which kinds of parts must belong to the individual. In the case of artifacts we do not have any constraints to determine which effectively are the proper parts of an artifact. We can easily show as in the case of the heap that grains are not the proper parts of the heap. It is rather the existence of that kind of shape which make us affirm that the heap exists. The mountain and the heap go on existing as a mountain and a heap if and only if they continue to show their typical shape that determine their specific identity but not their individual identity. As a matter of fact, from a logical point of view and also from a mere mereological one, we cannot establish which are the true essential parts of the Everest or of an individual determined heap.

5. The Structure of Life as a Criterion of Persistence

In his research van Inwagen tries to account in which way an organism is composed by its proper parts in an essential way differently from material things as mere aggregates or rearrangement of simples. Van Inwagen also assumes a critical standpoint about the problem of identity across world, about the problem of specifying the class of circumstances in which an object that in fact exists would have existed: “*none of these*

“*problems*” in my view is a real problem”¹³. To do that van Inwagen states an ontological principle called LIFE. I think this principle could offer an answer to the question: what is life? but I don’t believe it can really establish why certain parts can be essential proper parts of a living beings. I think a principle like the one I proposed in my precedent paper can instead offer a more complete ontological criterion to account for the existence of essential proper parts, specifically the fact that proper parts should be in existential dependence on one another¹⁴.

In the van Inwagen’s principle we have a characterization of LIFE as a self-maintaining event but not any self-maintaining event is a life because also a flame or a wave are self-maintaining events. Life is a self-directing event because it is a reasonably well-individuated event. There is a reasonably clear answer to the question whether a life that is observed at one time is the same life as a life that is observed at another time or place. If a life is at present constituted by the activities of simples Xs, as it is established in the answer to the Special Composition Question, and years ago was constituted by the activities of the Ys, then it seems natural to identify the two events if there is a continuous path in space-time from the earlier to the present space-time location along which the life has propagated itself. A flame is a self-maintaining event satisfying this constraint but does not seem to be nearly so well individuated as a life. For instance we cannot transfer life as we can with the wave, fire or flames. According to van Inwagen now that we have somehow grasped what is meant by a life, we can restate the proposed answer to Special Composition Question: in what circumstances are objects proper parts composing something? The Xs compose Y if and only if the activity of the Xs constitutes its life. X is a proper part of Y if and only if Y is an organism and X is caught up in the life of Y.

This solution is good even if *prima facie* it can leave a little unsatisfied. A problem of vagueness seems to emerge from this definition. We know that for the quantistic laws we are not able to state if an atom or an electron, in generally an elementary particle, is or not a proper part of something. It is a vague question. However it is not vague if a certain organ or a small piece of tissue is or not a part of a bigger organism. The vagueness concerning the elementary particle of organisms is a consequence of the intrinsic quantistic vagueness while at the level of proper

parts this kind of vagueness is lacking as in the case of the example of the brick where it is easy to establish if the brick belongs to the house or not.

I think the argument of van Inwagen about the non-existence of material artifacts is not really convincing. I believe it is true that artifacts are not substances but I do not believe van Inwagen has offered us a plausible argument for this shareable assumption. In sum, the argument is that objects or artifacts do not have proper parts because they are nothing but aggregates of simples and then simples cannot be proper parts of artifacts. I think that material things in order to have proper parts need an identity that does not depend on their parts or their nature. We can demonstrate this statement by illustrating the fact that: if simples do not constitute the identity of artifacts, then simples cannot constitute the proper parts of living beings because in this case they would not be substances but just aggregates. The proper parts of living beings are then some relevant complex parts of an organism in a way van Inwagen has not illustrated yet.

I think that the right way to establish what is a proper part of something should start from the specific identity of the whole entity. The right way is top down and not bottom up. It is the nature and the identity of the whole material beings that determines in an essential way what is a true proper part of them. The proper parts of a human being are not the same proper parts (for instance carbon atoms or something like that) of a unicellular living being and that depends on the specific identity of the living being.

If we believe that identity plays an important role in order to determine the proper parts of a material being then we can now try to answer the crucial question about when in general do organisms persist through changes in time. It would be nice to have an answer to the Special Composition Question that would at least suggest an answer to the great puzzle concerning their identity across time of material being. Does our answer to the Special Composition Question suggest an answer to the question: under what conditions does one and the same organism continue to exist?

According to van Inwagen, it is doubtful whether any answer to the Special Composition Question can logically commit us to any thesis about the persistence of objects through time. Van Inwagen believes that Locke has already offered an answer which is very close to his own. This

is Locke's answer: "*an animal is a living organized body and consequently the same animal is the same continued life communicated to different particles of matter as they happen successively to be united to that organized living body*". This is a passage of the famous section of Locke's Essays *Identity and Diversity*. However, van Inwagen does not agree with Locke's view that a certain person or thinking substance is not essentially a living animal and therefore is not essentially a man. Actually, in Locke's view an organism such as an oak tree or a man is at any given moment of time spatially conterminous with an object that is numerically distinct from it: a certain mass of matter, and typically the oak or the man will be conterminous with different masses of matter at different times. Each of the successive masses of matter associated for instance with me is a sort of momentary recipient of my life. On the contrary, in van Inwagen's view there does not exist any mass of matter numerically distinct from the living persisting being. Van Inwagen rejects the thesis that there are Lockean masses of matter. The part of Locke's thesis about organism accepted by van Inwagen is the following. Van Inwagen calls this principle LIFE and it tells us when an organism persists. LIFE: <if an organism exists at a certain moment, then it exists whenever and wherever the event that is its life at that moment is occurring. More exactly if the activity of the Xs at t_1 constitutes a life and the activity of the Ys at t_2 constitutes a life, then the organism that the Xs compose at t_1 is the same organism that the Ys compose at t_2 if and only if the life constituted by the activity of the Xs at t_1 is the life constituted by the activity of the Ys at t_2 >.

Organisms persist as the same organisms in virtue of life persisting. It is important to underline immediately that in order to apply this principles we should know when the life persists. The LIFE principles do not absolve us of our obligation to say as much as we can about the persistence of lives. I also wonder whether the life could be an intrinsically persisting individuated event or anything else. Let us first examine the question of the temporal continuity of lives. If a life is going on at t_1 and is not going on at the later time t_2 , is it possible for it to be going on at the later time t_3 ? Can the life of an organism stop and then start again? Can a life fall into two parts separated by a temporal pause?

Suppose that a man's heart stops beating and then he stops breathing and suppose that a doctor is able to start his heart beating again, can we say that the man who has been recovered is the man who was stricken by the heart attack?. We shall assume that we can. However, it is not completely sure that a man's life is not going on when his heart is not beating or even when blood is not circulating in his vein. We can imagine a more difficult case. Suppose we take a healthy cat and freeze it. Suppose we then revive the cat. It seems clear that the revived cat is the cat we started with. But it also seems clear that the cat's life ceased when it was frozen. There is only one cat in our story. According to van Inwagen, if life is suspended, then it is not disrupted, and a life is not disrupted if and only if the atoms, the simples, of which the cat is composed, continue to be bonded to one another by the complicated movements of electrons, photons, etc. If they were not so bonded the frozen cat certainly would dissolve into atomic nuclei.

We can now rewrite LIFE in this way: <if the activity of the Xs at t_1 constitutes or results from a life, and the activity of the Ys at t_2 constitutes or results from life, then the organism that the Xs compose at t_1 is the organism that the Ys compose at t_2 if and only if the life that the activity of the Xs at t_1 constitutes or results from, is the life that the activity of the Ys at t_2 constitutes or results from>.

Life has then important consequences for the persistence of organisms. Temporal and material continuity is necessary for the persistence of lives of organisms. But is spatial and material continuity a sufficient condition for the persistence of life? This is a very important point because it concerns the problem of cells division and those of embryonic growth.

Locke formulated two identity criteria through time, one for the persistence of organisms and one for the persistence of persons. The first one is typically called *Lockean continuity* while the second is the well known *principle of the continuity of consciousness and memory* in the same person through time. Let us take the classical material continuity. Suppose that the activity of the Xs constitutes a life at the time t_1 , suppose that a few of the Xs cease to be caught up in that life and suppose that those of the Xs that have ceased to be caught up on that life are replaced by some Ys in such a way that the Ys and the remnant of the Xs constitute that life. Suppose that this process of replacement continues in time until

all the Xs are replaced by the Ys. Is this life the same life that was constituted by the Xs? The Lockean answer is: yes it is. However, there are episodes of biological change that raise the question whether a life B which is spatio-temporally continuous with life A, and which is connected with life A by the Lockean continuity may or may not be the life of a different organism. Cell division and embryonic growth raise questions about the application of the concept of Lockean continuity. Another sort of case, specifically metamorphosis, suggests that two numerically distinct lives may be continuous with each other in the proper Lockean sense.

Let us first examine cell division. What happens to the life of an amoeba, a life just composed of one cell, during the mitotical process of fission in two cells? We have three possibilities. (1) The first option is that the life of the amoeba divides. An instant before it began to divide, the activity of the Xs - according to the answer to the Special Composition Question – constituted the life of the amoeba while an instant after the fission the activity of the Xs still constitutes a life but now are some Ys or Zs constituting the life of the two amoebas. We would have a situation where two lives - as to say to living beings – would be parts of just one and the same bigger life. This answer would yield the result that every amoeba is a virtual part of a vast scattered living being. This hypothesis is implausible because, according to van Inwagen, there must be some sort of causal interaction between the two or more separated parts of the bigger organism. The causal interaction would have to be continuous in time and space but this is not the case. In sum, we would have just one life and just one organism even if completely scattered in space and time. (2) The second option says that the old life of the amoeba is transferred to one of the daughter cells, and the other is somehow provided with a new life. We must have just two organisms not three or four with just one life. According to van Inwagen that would be arbitrary and absurd. (3) The old initial life ends. The life of each daughter cell is a new and distinct life. The initial simples, the Xs, stop to compose anything and their activity no longer constitutes a life. New simples begin to constitute a life and the preceding simples dissolve. If it is that the right account of the cell division then the beginning of a life is still a real mystery because where do new simples originate from? According to van Inwagen, it is tricky to develop the hypothesis demonstrating that the question whether Lockean spatio-

material continuity is a sufficient condition for the persistence of a life. We should like to say that the life of the cell has ceased when its chromosomes begin to split. But at least as far as we know there is nothing in the observable facts of cell division to prevent us from saying that the cell's life ends much later in the mitotic process at any time before the actual material separation of the daughter cells. But if the life of the amoeba ceases at any time before the actual physical separation we have a case of life ending without any apparent break in the Lockean spatio-temporal continuity of the process of life. The speculative description of the metaphysics of mitosis by van Inwagen entails that in most of the mitotic process there is not one but at least two or three lives constituted by the activity of the simples, and this description entails no break in the continuity of that process.

The ontological questions about the continuity of life raised by sexual reproduction are even trickier than the questions raised by cellular fission. What happens, metaphysically speaking, when a sperm unites with an egg? According to van Inwagen the sperm enters the egg and then each one ceases to exist – the simples that compose the sperm stop composing the sperm and the simples composing the egg stop composing the egg, then the simples of the sperm and of the egg begin to compose a new material being, a zygote. The new life begins and the old constituents of the precedent organisms - sperm and egg - are absorbed by it. A new living being now exists generated out of the simples that composed the sperm and the egg.

It is sometimes said the a zygote develops into a new individual, that a zygote is the starting point of an individual that tomorrow will be for instance a person. According to van Inwagen, this statement cannot be true because the zygote is a new individual from the starting, in Latin *ab initio*, that does not evolve in anything, instead at certain point in time of its life stops existing. It would not be true that you and I were once zygotes. About thirty hours after fertilization the zygote will divide mitotically. If what we have said about the metaphysics of cellular fission is correct then the zygote will cease to exist after the fission. But in this case you and I have never been zygotes. Whenever we came into existence it was more than thirty hours after our conception, the normal lifetime of a zygote.

What happens to a zygote during its fission? There would seem to be three possibilities. We can have the following views of the metaphysics of embryonic development.

- (1) The zygote A stops existing at t_1 . At t_2 neither B nor C nor anything else is A.
- (2) The zygote A replicates itself and continues to exist as identical to its replica, at t_2 either B or C is still A.
- (3) The zygote A changes its structure from one-celled to a two-celled organism. At t_2 A is just the mereological sum of B and C.

Van Inwagen favors possibility (1). The case (2) seems arbitrary and incongruent with the Leibnizian laws. An entity cannot be identical with two, three or millions of entities. (2) is also inconsistent with the thesis the we were once zygotes because we will be then always zygotes for all our life. (3) is the possibility chosen by those who think we were once zygotes and still are. The advocates of (3) believe that after the fission of A there is no longer any such cell as A. For them A is an individual composed at t_1 by one cell as part, at t_2 by two cells, at t_n by n-cells as its proper parts. The advocates of (3) will say that the individual A has billions of cells as its parts. The bad point is the way of thinking and speaking supported from the expression one-cell organism. If there can be a one cell-organism then surely there can be a two-cell organism? But a one cell organism is just a cell, then two-cells are just two cells. According to van Inwagen, it does not follow from the fact that the zygote is an organism and hence a real material being that the two-cell embryo that replaces the zygote is a real unique object and not two objects simply connected. Why should we believe that there is something, an individual, that B and C compose? The two cells adhere to each other but it seems we have no reason to suppose that the two material objects compose a singular individual thing. According to van Inwagen, while the zygote is really a single unified organism no such statement can be made about two cell embryo. The hypothesis of van Inwagen is that it seems more plausible to state that we have really two living beings not one. The simples that compose B and the simples that compose C do not jointly compose anything.

The crucial question is now: when does a multicellular organism, a singular individual, begin to exist? According to the answer to the Special

Composition Question: we have no artifacts but just arrangements of simples, and according to the principle LIFE: an individual life is something composed by the activity of the simples composing it. B and C together seem to be just cells that are arranged “embryonically”. We know that these cells can begin to compose something when their activity begins to constitute a life. But then when is this? When B and C begin to compose and constitute a life? The answer of van Inwagen is: I don’t know. Certainly not earlier than the organization of cell differentiation and certainly not later than the development of a functioning central nervous system, which in the case of human beings, takes place about twelve days after conception. According to a research in progress by Barry Smith and Berit Brogaard, a human being begins to exist at the sixteenth day. According to the argument of the sixteen days the embryo begins at this stage to be transtemporally identical to the future human being and person¹⁵.

If we look at the discussion below we see no necessity to state that B and C are composing an individual. B and C are also biologically and existentially independent from each other. It seems that B and C do not compose a substance because there is not any existential dependence between them. For van Inwagen to state the birth of an individual we have to wait for the moment in which the cells begin to enter into a sort of activity constituting a life. The difficulty is to establish exactly when it happens. It seems to me that speaking of existential and biological dependence relations between parts is more appropriate than simply speaking about activity of simples. According to van Inwagen, the boundaries of life are vague but in any case it is sure for him that the life of an individual begins later than that of a one-cell life like the one of a zygote.

It seems evident that the Lockean spatio-material continuity is not a reliable criterion to state the persistence through time of the existence of a material being. Neither in the hypothesis that subsists continuity nor in that continuity not verified, the life of a living being would be able indifferently to stop or continue. It seems then that they are the conditions that constitute the structure of life to constitute the principle of persistence of an individual or a material being. We know that the life of an individual can not be transferred to another individual. We cannot imagine mental experiments of biological and physical transfer of a life in another material being. We are not able to dispose criterions of individuation and discrimination of a

life from that of another individual, distinguished independently from the physical and qualitative aspects of the individual himself.

The numerical singleness of a life is not something guaranteed by the numerical and qualitative singleness of an individual living being in flesh and blood but from the maintenance of the life's structure. There are not many lives in a material being while to times it seems we could distinguish many material individual beings in just an organism. Let us take for instance the colonies of lichens. But even if it is the case that individuals do not persist in their individual or specific identity the persistence of life appear to be a sufficient condition to the persistence of an individual because the continuity of life is an event intrinsically independent by the manifold physical and qualitative changes of a material being in which the life is ontologically grounded.

As we continue to live we continue to exist as individuals. Our life perhaps is begun in a moment not well determined during our embryonic development and probably it will stop in a flash not well specified. Whenever my life began, it was already going on when I was born. There is a vagueness that appear insurmountable. Although in the course of our existence as individuals, we undergo radical physical and biological transformations it throws into question our continuous identities. However, we would not be able, under no circumstances, to affirm that our biological actual life is another in comparison with our past life. The life seems presuppose as its essential ontological conditions the change across time of its physical conditions of subsistence as a stable emerging structural phenomenon¹⁶. The life of the organism that I am and that emerged from that period of growth and development is my life despite the fact that it is continually constituted by the activity of different simples. In this sense we could say that the event that is our life would have occurred under an infinite array of different material circumstances.

6. Conclusions

The important point to underline is the apparent inadequacy of the Lockean principle of continuity. Material and spatial continuity does not constitute sufficient criterion to determine if an entity is still through time the same entity or if a life is still the same life. Many philosophers today

talk of ontological vagueness concerning a high number of predicates. It would be vague the boundaries between life and death. Predicates as rich, tall, clever would be vague. But also the qualitative identity of living beings would be vague. What are the right boundaries of the waves? When do the mountains begin? When exactly did Napoleon's decline start? What are the exact space-temporal boundaries of the French Revolution? At what age do we stop being children? Are these a kind of vagueness concerning intrinsically our language and our conceptual system or is it also a real ontological vagueness ¹⁷?

Van Inwagen affirms that if his answer to the Special Composition Question is correct then the relation part-whole is vague. And it will also be the notion of the continuity of identity. In fact there are simples such that it is neither definitely true nor definitely false that the activity of those simples constitutes a life. There will be then events of which it is neither definitely true nor false that those events are lives. We have said that a human embryo in the early stages of its development is a mere virtual object, a mere mass of cells. In the early stages of embryonic development the activity of these cells does not constitute a life. But will there be a moment at which the activity of these cells constitutes a life? Must there be an intermediate mathematical point between these two phases? For this question we will have just a vague answer as to the question at which moment the last Glaciation has finished. Individual human lives and also artifacts are infected by vagueness at both sides of their existence, at the beginning and at the end. The analytic ontology and mereology studying the boundaries of things seem threatened by these possible conclusions.

ENDNOTES

¹ I will refer in the article to the following texts by Peter van Inwagen. (a) (1981) *The Doctrine of Arbitrary Undetached Parts*, rep. in P. van Inwagen (2001 ed.). (b) (1990) *Material Beings*, Cornell University Press, Ithaca (NY). (c) (1990b) *Four-dimensional objects*, rep. in Van Inwagen (2001). *Temporal Parts and Identity Across Time*, “The Monist”, 3, pp. 437-59. (d) (2001) *Ontology, identity and modality. Essays in metaphysics*, Cambridge University Press, Cambridge (MA). (e) (2001 ed.) *Time and Cause. Essays Presented to Richard Taylor*, Reidel, Dordrecht. (f) (2002) *Metaphysics*, Westview Press, Boulder.

² See P. van Inwagen (2001: 2).

³ By P. Simons see (1994), *Particulars in Particular Clothing: Three Trope Theories of Substance*, “Philosophy and Phenomenological Research”, 54, 3, pp. 553-75, and (2000) *Identity Through Time and Trope Bundles*, “Topoi”, 19, 147-55.

⁴ See D. M Armstrong (1978), *Nominalism and realism. Universals and scientific realism*, 2. voll., Cambridge University Press, Cambridge, and (1980), *Identity through Time*, rep. in van Inwagen (2001 ed.).

⁵ W. V. O. Quine (1969), *Ontological Relativity and Other Essays*, Columbia University Press, New York and London.

⁶ On Tibble’s puzzle see D. Wiggins (1968), *On Being in the Same Place at the Same Time*, “The Philosophical Review”, 77, 90-95. P. Simons (1987), *Parts. A study in ontology*, Clarendon Press, Oxford, pp. 117-121.

⁷ P. van inwagen (1981: 191-192).

⁸ P. van Inwagen (1990: 19).

⁹ P. van Inwagen (1990: 21).

¹⁰ P. van Inwagen (1990: 72).

¹¹ P. van Inwagen (1990: 98).

¹² P. van Inwagen (1990: 158).

¹³ P. van Inwagen (1990: 161).

¹⁴ See C. Conni (2004), *Husserlian Pregnant Wholes as an Ontological Criterion for Individuals and Objects*, “Prajñā Vihāra. The Journal of Philosophy and Religion”, vol. 4, 2.

¹⁵ B. Smith & B. Broogard (2003), *Sixteen Days*, “The Journal of Medicine and Philosophy”, 28.

¹⁶ On the topic of emergent structures see my C. Conni (2005), *Identità e strutture emergenti*, Bompiani, Milan, forthcoming.

¹⁷ There is today a large debate on vagueness. You could See M. Tye (1990), *Vague Objects*, “Mind”, 99, 535-57. T. Williamson (1994), *Vagueness*, Routledge, London and New York, and A. Varzi (2004) *Vagueness*, “Dialectica”, forthcoming.