

55

INDIVIDUATION AND MEREOLOGICAL UNIVERSALISM

Pierdaniele GIARETTA

The claim that composite material objects exist can be supported by providing many examples of ordinary material objects, like tables, cars, dogs, pencils. However, it is well known that many philosophers would deny that some of the ordinary material objects accepted by common sense really exist while others would claim that objects exist which are definitely non-ordinary. Existence of non-ordinary objects follows from a view called "Mereological Universalism" by Van Inwagen, i.e. the thesis that any disjoint objects necessarily compose an object. Such a view is rejected by Van Inwagen in *Material Beings* (1990). His argument has been criticised and taken to be inconclusive. Indeed it fails to prove that the thesis of Mereological Universalism is false, and I will try to account for its failure by arguing that one of its premises lacks sufficient motivation. At the same time I will emphasise that Van Inwagen might provide some reasons for it which depend on thinking that general assertions of existence are justified only under certain conditions which do not seem to be satisfied by the thesis of Mereological Universalism, when this thesis is not read in the way indicated by the disputable premise.

1.

Both the thesis and the rejecting argument are formulated in terms of a notion of composition which Van Inwagen himself introduces. This notion is defined by using plural variables, i.e. variables which are meant to be bound by plural quantifiers, so that composition can be qualified as a multigrade relation, i.e.

– by and large – as a relation between a plurality of entities and an entity. The definition runs as follows:

the X compose y =_{df} the X are all parts of y and no two of the X overlap and every part of y overlaps at least one of the X

where X is used as a plural variable instead of Van Inwagen’s “the x s”¹. Thus the composite object turns out to be a fusion of the composing entities, which, according to the given definition, are required to satisfy the constraint of being disjoint. The constraint of being disjoint, which the composing entities are required to satisfy, avoids what Lewis and Varzi would call double counting, i.e. counting a part more than once when overlapping among the composing entities is allowed. It should be stressed that in such definition nothing implies that the composite object, if any, is unique.

The thesis of Mereological Universalism is so formulated:

It is impossible for one to bring it about that something is such that the X compose it, because, necessarily (if the X are disjoint), something is such that the X compose it (Van Inwagen 1990: 74).

Van Inwagen explains that according to this thesis «one can’t bring it about that the X compose something because they already do; they do so “automatically”» (*ibidem*). The explanation goes on by pointing out the following analogy:

Just as, according to the theory of sets, there has to be associated with the X a certain abstract object, a set that contains just the X , so, according to the theory we are considering, there has to be associated with the X a certain concrete object, a sum of the X . (*ibidem*).

In other words, just as a set exists if its elements exist, so a composite object exists if the composing entities exist². In the

1 Van Inwagen 1990: 29. Also in the following “the x s” is replaced with “ X ”.

2 After Boolos’ interpretation of second order quantifiers in terms of plural quantification it has become clear that plural variables may and, indeed, should not be understood as set-theoretic variables. It is not even true that, in general, for any X there is a corresponding

former case an abstract entity, in the latter a concrete one, is affirmed as existing, but in both cases its existence is qualified as automatic. Such an analogy is supported by a particular conception of sets, which could be called the combinatorial one and was first specified by Black, in contrast with Cantor's conception:

...Cantor's formula [by a 'set' we understand any assembly into a whole M of definite and well-distinguished objects m of our perception or thought], stripped to essentials, runs quite simply: "A set is an assembly into a whole of (well-defined) objects". Here, the phrase "assembly into a whole" certainly suggests that something is *to be done* to the elements, in order for the "whole" or "the unified thing", which *is* the set to result. But *what* is to be done...? ...The truth is that once the elements of a set have been identified, *nothing* need or can be done to produce the corresponding set. (Black 1971: 621)

The idea that analogously with the case of sets nothing need or can be done to get the composite object from the composing entities plays a major role in the justification of the most crucial assumption of Van Inwagen's argument. Let us look at the premises of the argument, as listed by Van Inwagen (1990: 75).

The first two are:

- A. I exist now and I existed ten years ago.
- B. I am an organism (in biological sense), and I have always been an organism.

We can say that (A) and (B) introduce an organism p which existed at a certain time t and has continued to exist until time t' , ten years after. Let us neglect the objections which could be raised against (A) and (B)³.

set containing just the X . Like Van Inwagen, I will neglect this important logical problem in the following, since it is quite plausible that any logical constraint on the existence of sets would not substantially affect the point of the drawn analogy.

3 Van Inwagen himself does partially neglect such objections.

The third premise states:

- C. Every organism is composed of (some) atoms (or other) at every moment of its existence.

In a note Van Inwagen specifies that he means «chemical atoms – atoms in the modern, scientific sense – not mereological atoms», but he immediately adds that «the argument could as easily be stated in terms of mereological atoms or “simples” as in terms of chemical atoms» (1990: 288). I will assume that mereological atoms are referred to.

The fourth and the fifth premises state, respectively:

- D. Consider any organism that existed ten years ago; all of the atoms that composed it ten years ago still exist.
- E. Consider any organism that exists now and existed ten years ago; none of the atoms that now compose that organism is among those that composed it ten years ago.

(C), (D), and (E) are taken to express empirical facts, even if, when referring to chemical atoms, unstable atoms could falsify (D) and a few of the atoms could still compose the same organism after ten years. Van Inwagen neglects such subtleties. So do I.

From (C), (D), and (E) it follows that the object p , introduced by (A) and (B) as an organism existing at t and at t' , is composed by some atoms X at t , such atoms X exist also at t' but at t' p is composed by some different atoms Y .

Let us now introduce the sixth crucial premise

- F. If Universalism is true, then the X cannot ever compose two objects. That is, the X cannot compose two objects either simultaneously or successively. More formally, if Universalism is true, then it is not possible that $\exists y \exists z \exists w \exists v$ (the X compose y at the moment w , and the X compose z at the moment v , and y is not identical with z).

(F) implies that, if Mereological Universalism is true, then the atoms X composing p and only p at t compose p and only p also at t' . But it follows from the other premises that it not true that p

is composed by the atoms X at t' . So the antecedent of the sixth premise is false, i.e. Mereological Universalism is false.

2.

The most controversial assumption is the sixth one as Van Inwagen himself acknowledges. He seems to appeal to the consideration that if, given any objects, however taken or situated, nothing is relevant to the existence of an object composed by them but the existence of the composing entities, then nothing should be relevant to the identity of the composed object but the identity of the composing entities. Such a consideration relies on the analogy with sets, as combinatorially conceived. Let us give a closer look at this analogy in order to see whether and in which sense it holds and then to evaluate whether it really supports Van Inwagen's sixth premise.

Following Pollard's approach (1996) let us introduce the predicate "comp" as standing for a many-one relation of composition in the multigrade sense⁴. "Are all the elements of" could be one of its interpretations, "are all the parts of" another one. The first is the set-theoretical interpretation and the latter is to be understood as a mereological interpretation. In both interpretations it holds that:

$$I. \quad \exists X (X \text{ comp } a \wedge X \text{ comp } b) \rightarrow a=b$$

"Are all the parts of" is not the only possible mereological interpretation of "comp". The predicate "comp" can be interpreted in Van Inwagen's defined sense of sum (y is a sum of the X =_{df} the X are all parts of y and every part of y overlaps at least one of the X). Then (I) still holds and amounts to *Uniqueness* of sum, i.e. extensionality holds for mereological fusions too.

Does Van Inwagen accept (I)? Van Inwagen is committed to (I) when "comp" is interpreted as "are all the parts of", since it follows from two principles he accepts, i.e. reflexivity and antisymmetry of parthood (1990: 55). If the predicate "comp" is

4 "comp" is not Pollard's predicate, but it is used in a similar way as Pollard's predicate.

interpreted in Van Inwagen's defined sense of sum or in Van Inwagen's defined sense of composition, i.e. if (I) is such that it amounts to *Uniqueness* of sum or of composite object, Van Inwagen does not assume it. However *Uniqueness* of sum is a theorem of classical mereology and, if the predicate "comp" is interpreted in Van Inwagen's defined sense of composition, he might see (I) as something implicit in the analogy with sets which, in his opinion, is suggested by the thesis of Mereological Universalism. Indeed, if reference to time is left aside, the sixth premise presents (I) as a consequence of the thesis of Mereological Universalism⁵.

(I) only excludes that some things compose different objects, not that some things compose an object and also some other things compose it. So (I) does not allow us to take the individuality of the composed object as reduced to the individuality of the composing entities. To get such a reduction the following principle is needed:

$$\text{II. } \forall X \forall Y ((X \text{ comp } c \wedge Y \text{ comp } c) \rightarrow X=Y)$$

where " $X=Y$ " is to be taken as an abbreviation of " $\forall z (Xz \leftrightarrow Yz)$ ". (II) implies that different pluralities of things do not compose the same object. Only assuming it together with (I) can it be said that identity questions among composite objects reduce to identity questions among the composing entities.

(II) holds in the set-theoretical interpretation, but not, in general, in the mereological interpretation. However if X and Y plurally stand for atoms, and everything is a sum of atoms, then (II) holds also in the mereological interpretation. So we can conclude that in order to specify the identity of a mereological composite object, nothing else has to be done than to specify its

5 On p. 55 Van Inwagen (1990) seems to accept principles such that when the thesis of Mereological Universalism is added to them, a system is got which is as strong as the system presented by P. Simons (1987: 37). This system is presented by Simons as though including *Uniqueness* as a theorem and so is intended by him as a version of the classical extensional mereology. It follows that Van Inwagen would be formally justified in assuming the sixth premise, at least if time is not taken into account or only existence and uniqueness at a time are taken into account. However it is not so! Simons' axioms are satisfied by the model he describes at p. 28, but this model does not satisfy *Uniqueness*.

composing atoms. This really seems to suggest that nothing else is relevant to the identity of the composed thing than the identity of the composing atoms, in the sense that identity questions among composite objects reduce to identity questions among the composing atoms.

Is this enough to support Van Inwagen's sixth premise? No. In his argument Van Inwagen uses a temporally relativised notion of composition of the form " X compose z at t ". This notion can be taken to be defined by temporally relativising the definition of composition introduced by Van Inwagen. Regarding (II), temporal relativisation leads to:

$$\text{II}_t \quad \forall X \forall Y \forall t ((X \text{ comp } c \text{ at } t \wedge Y \text{ comp } c \text{ at } t) \rightarrow X=Y)$$

(II_t) could be taken for granted, but to justify the sixth premise Van Inwagen needs to show, in particular, that the thesis of Mereological Universalism supports something like:

$$(*) \quad \forall X \forall Y \forall t \forall t' ((X \text{ comp } c \text{ at } t \wedge Y \text{ comp } c \text{ at } t') \rightarrow X=Y)$$

(*) does not logically follow from (II_t), not even from (II_t) in conjunction with the temporally relativised analogue of the thesis of Mereological Universalism:

$$\text{III. } \forall X \forall t ((\text{disjoint}(X) \wedge \forall z (Xz \rightarrow z \text{ exists at } t)) \rightarrow \exists z (X \text{ comp } z \text{ at } t))$$

where the predicate "disjoint" is to be taken as appropriately defined. It is fairly obvious that (II_t) and (III) do not logically imply (*), either when "comp" is interpreted as Van Inwagen's defined notion of composition⁶. (II_t) and (III) do not conflict with

6 That can be formally shown by interpreting the predicate "comp" as a suitable relation of occupation in such a way that, when X and Y are restricted to atoms, (II_t) expresses the true proposition that if at any time the atoms X and the atoms Y occupy the same region of space, then they are the same and (III) expresses the true proposition that at any time disjoint atoms existing at t occupy a region of space, but, of course, what (*) expresses in this interpretation, i.e. that a region occupied by atoms at different times is occupied by the same atoms, is not generally true.

Objections could be made that the occupation relation does not satisfy all principles adopted by Van Inwagen on the composition relation. Not, for example:

the fact that the object p , as described on the basis of the first five premises, was composed by the atoms X at t and by the different atoms Y at t' . Let us remember that also the atoms X are supposed to exist at t' and, by the thesis of Mereological Universalism, they compose an object at t' , say q . As far as (II₁) and (III) are concerned, it is not excluded that q existed at t and it too was composed by the atoms X . If contingent identity is rejected, hence it is taken that

$$a=b \text{ at } t \rightarrow a=b$$

such a case is excluded by the following temporally relativised version of (I):

$$\exists X (X \text{ comp } a \text{ at } t \wedge X \text{ comp } b \text{ at } t) \rightarrow a=b \text{ at } t$$

Now, let us assume that contingent identity is rejected, so that the temporally relativised version of (I) reduces to:

$$(I_1) \quad \exists X (X \text{ comp } a \text{ at } t \wedge X \text{ comp } b \text{ at } t) \rightarrow a=b$$

(I₁) is implied by the consequent of (F) and so should be supported by (III), i.e. the thesis of Mereological Universalism. How is it possible? Van Inwagen might have an intuitive partial justification. Let us fix a certain time t . If at t nothing but the composing entities is relevant to the identity of an object

If each of the X has a surface and the X compose y , then y has a surface and the surface area of y is less than or equal to the sum of surface areas of the X .

If each of the X has a mass and the X compose y , then y has a mass and the mass of y is the sum of the masses of the X .

If each if the X occupies a region of space and the X compose y , then y occupies the sum of the regions occupied by the X . (Van Inwagen 1990: 44).

However also sets and membership do not satisfy all the principles concerning composition. Thus the objection against the interpretation in terms of occupation could be legitimately raised by one intending to argue for (*) on the basis of (II₁) and (III) only if he is willing to withdraw the analogy with sets as a reason supporting the sixth premise. Another objection, which could be raised from a common sense point of view, is the following: the occupation relation of the occupying atoms to the occupied region is, so to say, more extrinsic than the relation of the composition relation of the composing atoms to the composed object. Things look as though they are related to their composing atoms more strongly than they are to the region they occupy.

composed by them at t , there cannot be at t two objects composed by them. Let us grant the truth of this conditional and of its antecedent⁷. Can this help Van Inwagen in justifying (*), i.e. that a composite object does not change composition?

(I₁) excludes that objects having the same composition at a given time are different, but does not exclude that a composite object changes composition through time, that is it does not exclude that (atomic) compositions, at different times, are different, while the composite objects are identical. For, even if it emerges each time that identity of composite objects is reduced to the identity of the composing entities, since at every time composite objects are the same if and only if their atomic components are the same, nothing is implied with regard to the identity among objects picked up at different times. Analogy with sets could not be appealed to in order to exclude that a composite object can change composition: sets are not temporal entities, indeed the very concept of their existence in time and through time is, at least, something which cannot be immediately grasped or intuited. Thus (I₁) does not provide any support to (*) and assuming the analogy with sets does not appear to be appropriate.

3.

If (I₁) does not provide a full specification of the identity of a composite object and analogy with sets cannot be appealed to in order to complete such specification, how, otherwise, could the identity of a composite object like p be specified? A quick mathematical answer could consist in taking the identity of the composite object as given by a set representing the composition of the object along its whole existence. Such a set should be constituted by couples of the form $\langle n, X \rangle$, where n is a time and

7 The conditional «if at t nothing but the composing entities is relevant to the identity of an object composed by them at t , there cannot be at t two objects composed by them» is not to be confused with the wrong thesis that the temporally relativised version of (I) is a formal consequence of the temporally relativised version of the unrestricted principle of Composition, called summation by Van Inwagen, when parthood is only taken as satisfying assumptions on p. 55 of Van Inwagen (1990). On this point recall note 5.

X plurally stands for atoms, and, if (I) is to be satisfied, it should not contain any two different couples having the same first member⁸.

Of course, the quick mathematical answer is not an interesting answer to the individuation question. What we are looking for is a principled understanding of the way in which composite objects are individuated. To this purpose it is natural to look at something which is given together with the composing atoms and which can change through time. Van Inwagen gives an example in terms of blocks, not of atoms, but his example is meant to illustrate a point concerning atoms. Van Inwagen tacitly assumes that for any blocks existing at any given time, their arrangement is unique. In his own words Van Inwagen's example is the following:

Consider an object that is composed of the blocks at t , when they are widely scattered and moving rapidly in relation to one another. How long does it last? Only two answers seem possible. (1) It doesn't last at all; it exists only at t . (2) It lasts as long as its constituent blocks do. Any compromise between these two answers would be intolerably arbitrary: If the blocks "automatically" compose an object, then either any rearrangement of the blocks must destroy that object, or else no rearrangement could destroy it. (1990: 77)

He goes on observing that the former answer has implausible consequences and so he concludes that «Universalism... cannot countenance the supposition that at two different times – or at one time – the X compose two different objects» (*ibidem*).

It follows that the following claim which Rea takes as quite plausible should be rejected:

(α) For some X , what the X compose depends upon how the X are arranged. (Rea 1999: 202)⁹

8 Objections could be made that to specify the identity of a composite object its alternative compositions in different possible worlds also have to be taken into account. It is fairly obvious that an analogous, only more complicated, mathematical answer could be given and so I set this objection aside.

9 Here and below symbols are used which are slightly different from the originals.

McGrath (1998) puts the rejection of (α) down to the acceptance of the following principle:

(P1) If the X automatically compose something at t , there is exactly one object o they automatically compose at t , their sum (McGrath 1998: 118).

where “the X automatically compose something at t ” means “the mere existence of the X at t is necessarily sufficient for there being, at t , a y such that the X compose y ” and “the X automatically compose object o at t ” means “the mere existence of the X at t is necessarily sufficient for the X composing o at t ” (*ibidem*). Rea seems to agree with McGrath that (P1) is accepted by Van Inwagen and takes its acceptance as a mistake. (P1) looks as an instance of the invalid principle that necessarily something being F implies something necessarily being F , and Rea observes that one can hold that «for some X , the mere existence of the X is necessarily sufficient for their composing something but it is not necessarily sufficient for their composing what they now in fact compose» (Rea 1999: 203).

Is Rea right in diagnosing what is going on in Van Inwagen’s argument? Let us recall that already in the comments accompanying the presentation of the thesis of Mereological Universalism Van Inwagen assumed that if nothing is relevant to the existence of a composite object but the existence of the composing entities, then nothing else but the identity of the composing entities is relevant to the identity of the composite object. Afterwards he seems to take into account the hypothesis that something which is always given together with the composing entities contributes to determining the identity of the composed object. Arrangement of the composing atoms is what he mentions in this connection. He refers to a rather simple example, the blocks example, and with reference to it, he makes an assumption which, given the nature of the example, can be generalised in the following way:

G. For any X the arrangement of the X is always relevant to the identity of the object composed by the X or for any X the arrangement of the X is never relevant to the identity of the object composed by the X .

Van Inwagen does explicitly state a consequence of (G) which can be generalised as follows:

(G') For any composite object, either any rearrangement of the composing atoms destroys the object, or else no rearrangement of the composing atoms destroys it.

The rejection of (α) is not drawn by Van Inwagen from (P1), as McGrath and Rea claim, but from (G') by showing that the alternative that any rearrangement of the composing atoms destroys the composite object is absolutely implausible. Granting that (G) implies (G'), the soundness of Van Inwagen's argument appears to depend on the following two points:

- 1) whether (G'), if not (G), is sufficiently motivated;
- 2) whether the arrangement of the composing atoms is the only other thing which might determine the identity of a composite object.

In reference to the motivation of (G'), Van Inwagen affirms that any compromise between the two alternatives is intolerably arbitrary. It is not clear what Van Inwagen has in mind. I will try to provide some possible reasons for (G'), without claiming that they are what Van Inwagen thinks of when he says that any compromise between the two alternatives is intolerably arbitrary.

Let us suppose that, as a matter of fact, for some X any rearrangement of the X destroys the object composed by the X and that for other X no rearrangement of the X destroys the object composed by the X . Is it really justified to hold *a priori* that in any case a composite object exists, independently of the effect of the rearrangement of the composing entities on the existence of the composite object? Some analytic philosophers think that

- 1) existence cannot be justifiably affirmed without possessing a conception of the identity of the entities affirmed to exist¹⁰ and that

10 A conception of identity does not need and should not be provided by identity criteria. Insofar as identity criteria are framed in a reductivistic perspective, they cannot provide a general notion of identity.

- 2) the way in which a material being comes into existence, goes on existing and ceases to exist characterises its identity.

If such theses are accepted, then, in particular, existence of material beings should be affirmed only in the context of some specification of their persistence through time. Van Inwagen might think that when such a general affirmation of existence is made as the thesis of Mereological Universalism, nothing general and non-arbitrary can be said about the question of identity. For example, if it is said that the composite object exists when, and only when, the composing atoms form a shape satisfying certain requirements, the specification of these requirements appears to be difficult to achieve. Some changes of shape imply a change of object, but which ones? Is it possible to give a unique general answer? On the other hand a criterion based only, for example, on the number of rearrangements, would surely give unacceptable results. In both cases it does not seem possible to identify, a priori and in general, those rearrangements, if any, which imply the destruction of the composite object.

Regarding the question whether the arrangement of the composing atoms is the only other thing, besides the composing atoms, which might determine the identity of a composite object, a very old philosophical idea should be taken into account. It is the idea that a composite object is the result of composing certain entities in a certain way. So an object is individuated not only by the composing entities, but also by the manner of composition¹¹. However, this notion can be appealed to in order to admit different entities constituted at the same time by the same composing entities only if mereological extensionality, as formulated by (I), is not assumed as valid for the general not qualified relation of composition¹². But Van Inwagen does not take into account the hypothesis that mereological extensionality as formulated by (I) might be false, but only the hypothesis that the thesis that a composite object can change composition might be false. So the starting point of Van Inwagen's discussion of (*)

11 Arrangement can surely be taken into account as a manner of composition, but the notion of manner of composition is more general.

12 This relation can be identified with the union of the different relations of composition arising from the different manners of composition.

seems to be that manner of composition can affect only how long the composite object persists through time. Is Van Inwagen justified in taking into account only this possibility? If Van Inwagen grants that arrangement could be relevant to the question of persistence, he should also grant that it is relevant to the question of which objects exist at a given time. It cannot be excluded, without any argument, that there are objects which at a given time are distinguished only by the different ways of persisting.

It may be useful to mention that Fine (1994) presents two manners of composition as generating different kinds of composite entities, i.e. the aggregates and the compounds. Fine's manners of composition are connected with different kinds of persistence of the composite entity – the aggregate exists when and only when at least one of the aggregated entities exists and the compound exists when and only when all of the components exist – and they can affect the same composing entities at the same time, that is at a given time the same entities can compose both a compound and an aggregate. From a three-dimensional point of view, an ordinary material object is neither an aggregate nor a compound¹³. So other coinstantiable manners of composition are also to be admitted. Is the admission of a plurality of manners of composition, possibly constituting the only difference among some material entities existing at a given time, logically consistent with the thesis that the mere existence of any material entities implies the existence of a material entity composed by them? The answer depends on which mereological principles are presupposed. It is not consistent, if a system of principles for classical mereology is assumed. Van Inwagen does not presuppose it, but only weaker principles which are formally consistent with the thesis that there are or there can be different material entities constituted at a given time, or perhaps also at all times, by the same atoms¹⁴.

13 If composite objects are taken to be aggregates, then an ordinary material being should exist before and after the temporal interval of its existence as normally conceived. On the other hand, if composite objects are taken to be compounds, then an ordinary material being should exist for only a temporal subinterval of its existence as normally conceived.

14 See note 5.

However, if different entities exist or can exist which are composed by the same entities, it does not seem justified to affirm, as in Van Inwagen's opinion Mereological Universalism claims, that the existence of the composing entities is the only ground for the existence of a composite entity. Or, at least, the assertion that a composite object exists should go together with a specification of the kind of composition spoken of. The thesis of Mereological Universalism, as formulated by Van Inwagen, excludes that such specification is needed and this can suggest, but does not imply, that there is only one kind of composition. Van Inwagen takes the kind of composition as analogous to the way in which a set, combinatorially conceived, is determined by its elements, and so thinks that, if composition is to be conceived in this way, it is impossible that there be, at any time, different objects composed by the same atoms. Of course, the analogy with sets may be questioned. However, it is not easy to see on which other basis it can be affirmed that for any given entities there is an object composed by them.

To conclude, if the analogy with sets is presupposed by the thesis of Mereological Universalism, Van Inwagen should not grant the possibility that something like the manner of composition affects persistence and so the identity of the composite object: the question has already got a negative answer on the basis of the analogy with sets. However, analogy with sets is not appropriate when concrete persisting entities are spoken of.

On the other hand, if the analogy with sets is not presupposed by the thesis of Mereological Universalism, then Van Inwagen has not proven that if Mereological Universalism is true, then there is at most one way in which entities are composed at a given time, but it should be granted that it is not very clear how the identity of a composite object is in general to be conceived. Assuming that for any composing entities a composite object always exists requires that the identity question be answered, but a general answer does not seem to be possible. When composite objects are not taken as analogous to sets, the difficulty of providing such a general answer may be traced back to the very unrestricted principle of existence of a composite object, relying on the theses that existence cannot be affirmed without a

conception of identity and that conditions of persistence characterise identity.

4.

Wiggins seems to have an answer to the question: what kind of entities does Mereological Universalism affirm as existing? We are told that the composite objects which are affirmed as existing by the unrestricted principle of Composition are special entities, i.e. aggregates, but aggregates are not all the material entities. There are ordinary composite objects which are not aggregates: they only correspond to aggregates, since they are composed of entities which the corresponding aggregates are composed of. So it seems that he would accept the thesis of Mereological Universalism, but he would not read it as conceptually implying that mereological extensionality is valid on the whole domain of material entities on which composition is defined. This seems to block the possibility of providing a general uniform notion of composite object. On the other hand Wiggins is known as the main proponent of the theses that existence cannot be affirmed without a conception of identity and that conditions of persistence characterise identity. In the end does it emerge that Wiggins lacks a unified conception of composite object? Let us first sum up Wiggins' approach to the subject of mereological composition.

Wiggins, who writes before Boolos' introduction of plural quantification, adopts Tarski's definition of sum, and takes aggregates to be sums. Such definition makes reference to the elements of a non-empty class and not to entities plurally quantified over. Wiggins seems to accept the existence of aggregates without any restriction, but does not take *Mereological Extensionality*, i.e. the principle that fusions of the same things are identical, as universally valid. *Mereological Extensionality*, and so the axioms of mereology, are taken as valid on a restricted domain of entities which Wiggins calls collections in mereological sense or aggregates. Since Tarski's definition of fusion also applies to entities which according to Wiggins are outside this

domain, it seems to follow, a bit paradoxically, that mereology does not concern all fusions but only some of them¹⁵.

Wiggins' notion of aggregate cannot be simply provided by the Tarskian definition of sum. For he makes the point that, for instance, the jug and a suitable corresponding collection of bits of china-clay are different entities and only the latter is taken to be an aggregate, even if such bits are part of the jug and no part of the jug is disjoint from each of them and, similarly, such bits are part of the collection and no part of the collection is disjoint from each of them. What is the relation between the two entities? Wiggins (1980: 31) claims that the jug is made of china-clay or is constituted by the collection of china-bits.

Against Shoemaker Wiggins also holds that there is nothing wrong in saying that the statue is composed of a piece of bronze and that the piece of bronze is composed of a statue. This affirmation is made and commented in the following way:

In my usage of “compose” and “constitute”, a usage suggested by mereology (but which I believe to agree with the underlying logic, stripped of pragmatic accretions, to which the expressions conform in English) there is nothing actually wrong in saying what Shoemaker thinks it is not right to say [[the statue] is composed of a *piece* of bronze and ... the piece of bronze is composed of a statue]. And identity is even a special case of constitution. For any x , x compose x . But neither x composes y nor y composes x nor the conjunction of these sentences actually entails “ $x=y$ ”. (Wiggins 1980: 197)

Wiggins can consistently reject *Antisymmetry of Composition*, i.e. the implication:

If x composes y and y composes x , then $x=y$

where “compose” seems to be synonymous with “is a part of”, just because he does not take *Mereological Extensionality* as universally valid. For such an axiom allows us to deduce “ $x=y$ ”

15 Van Cleve (1986: 150-151) emphasises that Wiggins should specify on which grounds it is possible to isolate the fusions which mereology is about, but he also thinks that Wiggins does not provide such a specification. I disagree. Wiggins has at least something positive to say in this regard, as I will point out in the following.

from “ x is a part of y ” and “ y is a part of x ”, and so can justify the definition of “ $x=y$ ” as “ x is a part of y and y is a part of x ”¹⁶.

Rejection of *Mereological Extensionality* entails that it is not possible to speak of *the* entity which is composed by given entities: composition is not enough to identify only one entity. Then what is the relation between composition and identity according to Wiggins? In the above quoted passage Wiggins says that identity is a special case of constitution and this could suggest that “constitutes” has to be taken to mean “is a proper part or is identical to”. However adopting this definition allows to prove *Antisymmetry of Composition* very easily and then to prove also *Mereological Extensionality* from the other principles of classical mereology. So it seems that it is not possible for Wiggins to accept the suggested definition of constitution. For he holds that the collection of bits of china-clay constitutes the jug without being a proper part of the jug, but the above definition would imply that the collection is identical to the jug.

The relation between the material entities which are aggregates and the material entities which are ordinary objects is not so clear. The same entities can compose an aggregate and an ordinary object, the aggregate and the ordinary object being different objects, but it is at least puzzling that the primitive mereological relation of part-of is assumed to apply both to aggregates and to ordinary objects. Aggregates and ordinary objects of different kinds are distinguished by their different ways of persisting, and Wiggins identifies what grounds the way of persisting of aggregates with the existence of the composing entities. For he says:

...the whole rationale of their [i.e. Lesniewski or Goodman] theories of aggregates was the unique determination of aggregates by their constituents and their exhaustion by these. No other mode of determination is provided for, or conceivable. (If another mode were devised it would be a principle of individuation for substances, or wholes not necessarily subject to mereology). (1986: 307)

16 See Wiggins 1980: 93.

However Wiggins does not claim that nothing but the composing entities is relevant to the identity of any object composed by them, as the thesis of Mereological Universalism seems to involve in Van Inwagen's reading. That concerns only the entities called aggregates. So Wiggins can reject that any given entities compose at most one thing: for every ordinary thing there is an aggregate, a different entity, which is composed of the same atoms.

Leaving aside the non-principled way in which the restriction is introduced, a problem arises from thinking of aggregates as concrete entities which we can be causally related to. To think of the atoms composing an ordinary object and also as composing an aggregate one needs to abstract from the relations they have with each other, but it is doubtful that a concrete entity can result from such an abstraction, over and above the composing atoms. Could it be claimed that no other entity is affirmed to exist over and above the composing atoms, more or less as suggested by Lewis' thesis of Composition as identity? This would imply that the unrestricted principle of Composition is literally false or, at least, that speaking of sums or fusions can be dispensed with. Perhaps aggregates are only reifications of pluralities which enhance brevity and expressive power in ontological discourse. Wiggins himself does not really seem to need them in order to propose his conception of a continuant as an entity provided with a way of persisting which it can share with other entities.

Dipartimento di Filosofia
P.za Capitaniato 3
35139 Padova (Italia)
e-mail: pierdaniele.giaretta@unipd.it

References

- BLACK M. (1971). The Elusiveness of sets. *Review of Metaphysics* 24, 614-636.
- BOULOS G. (1984). To Be is to Be a Value of a Variable (Or to Be some Values of some Variables). *Journal of Philosophy* .

- FINE K. (1994). Compounds and aggregates. *Noûs* 28, 137-158.
- LEWIS D.K. (1991). *Parts of Classes*. Oxford: Oxford University Press.
- MCGRATH M. (1998). Van Inwagens's Critique of Universalism. *Analysis* 58, 116-121.
- POLLARD S. (1996). Sets, Wholes, and Limited Pluralities. *Philosophia Mathematica* 3, 42-58.
- REA M. (1998). In Defence of Mereological Universalism. *Philosophy and Phenomenological Research* 58, 347-360.
- REA M. (1999). McGrath on Universalism. *Analysis* 59, 200-204.
- SIMONS P. (1987). *Parts: a Study in Ontology*. Oxford: Clarendon Press.
- VAN CLEVE J. (1986). Mereological Essentialism, Mereological Conjunctivism, and Identity Through Time. *Midwest Studies in Philosophy* 11, 141-156.
- VAN INWAGEN P. (1990). *Material Beings*. Ithaca: Cornell University Press.
- VARZI A. (2000). Mereological Commitments. *Dialectica* 54, 283-305.
- WIGGINS D. (1979). Mereological Essentialism: Asymmetrical Essential Dependence and the Nature of Continuants. *Grazer Philosophische Studien* 7/8, 297-315.
- WIGGINS D. (1980). *Sameness and Substance*. Oxford: Blackwell.