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Criteria of Identity and Two Modes of Persistence*

> We, as a species, are very good at physics, and — all the evidence suggests this — very bad at metaphysics. Perhaps we shall one day discover among the stars a species that is very good at metaphysics and very bad at physics. […] Perhaps human metaphysicians are like that: they work by taking human intellectual capacities designed for purposes quite unrelated to questions about ultimate reality and pushing these capacities to their limits. It may be that a comparison Samuel Johnson used for a rather different purpose applies to the human metaphysician: such a person is like a dog walking on its hind legs. "It is not done well," said Dr. Johnson, "but you are surprised to find it done at all."
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> Peter van Inwagen

Philosophical discussions on the issue of persistence over time — the persistence of persons in particular — are mainly concerned with the question of what persistence consists in.[1] The very fact that objects persist over time is rather not the subject

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[1] On a standard approach to persistence, ordinary objects persist by enduring, i.e. by being *wholly present* at each of the times they exist (endurantism). According to the doctrine of temporal parts (perdurantism), things persist not by enduring but by perduring, i.e. by being only *partially present* at each of the times they exist. The doctrine of temporal parts is sometimes developed in such a way that things persist not by having temporal parts at each of the times they exist (*worm view*) but rather by having different temporal counterparts at each of these times (*stage view*). Although my theoretical sympathies run closer to the endurantist perspective, the interpretation proposed in this paper seems to be a conciliatory one. What this approach partly alludes to is the following passage from David Lewis's work: "There might be mixed cases: entities that persist by

of the debate. Philosophers are more interested in finding out how this happens, i.e. what does it take for an object to persist from one time to another. In response to this question, they usually formulate certain criteria of diachronic identity for objects of the examined kinds, assuming — explicitly or implicitly — that persistence of objects is open to be reconstructed and analysed in terms of identity, and that identity itself consists in, or is reduced to, some further facts.

In what follows, I would like to challenge the widespread reigning practice on this score and to outline, in a preliminary and schematic way, an interpretation according to which, firstly, persistence over time need not, but still can, consist in being wholly present in each time of existence (and therefore also — in preserving numerical identity). Secondly, the criteria of identity referred to in philosophical disputes are not, in the overwhelming number of cases, criteria of identity in the strict sense of the term, but rather criteria of persistence. Finally, there are no non-circular and informative metaphysical criteria of diachronic identity that would provide conditions of identity in the form of necessary and sufficient conditions as truth-conditions for statements about identity.[2]

This paper aims, on the one hand, to distinguish persistence reconstructed by means of the concepts of *being wholly present* and *numerical identity* from persistence analysed in terms of *genidentity*, and, on the other hand, to propose — contrary to the prevalent practice in the current philosophical literature — a slightly modified role for criteria of identity. If my proposals bear any signs of soundness, they would contribute to a reinterpretation of the whole dispute on persistence over time. This reinterpretation, however, would by no means be unduly radical: it would only change, to some extent, the intellectual role of criteria of identity and affect the evaluation of both some thought experiments and the results obtained in the course of the debate. The account proposed here neither invalidates the addressed issues nor requires a rejection of any common-sense beliefs or previously maintained metaphysical positions. Nevertheless, I hope it will help to improve the dispute on persistence over time.

1. THE GENERAL FORM AND ROLE OF CRITERIA OF IDENTITY

At the outset, I would like to make it clear that I am not going to consider the important question, recently raised in the literature, of whether criteria of identity are,

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having an enduring part and a perduring part. An example might be a person who consisted of an enduring entelechy ruling a perduring body; or an electron that had a universal of unit negative charge as a permanent part, but did not consist entirely of universals. But here I ignore the mixed cases" (Lewis 1986: 202). More on the classical endurantist approach, see e.g. Oderberg 1993, Lowe 1998; for the worm view, see Heller 1991; for the stage view, see Hawley 2001, Sider 2001; for alternative solutions, see e.g. Simons 2008, Brower 2010, Piwowarczyk 2010. Haslanger and Kurtz (2006) compiled an excellent anthology of many essential readings. For a very useful overview of the whole debate, see e.g. Effingham 2012 and Haslanger 2003. See also Wasserman 2016.

[2] For more on argumentative strategies supporting this last thesis, see also Grygianiec 2013, 2016.

in fact, hidden criteria of application of concepts (Noonan 2007, 2009, 2011, Epstein 2012). This issue is extremely important for the procedures of individuation and for differentiation between natural kind terms, on the one hand, and typical classificatory general terms and predicates on the other. In this respect, criteria of identity preserve their logical and pragmatic values but are interpreted in a slightly different manner. The results obtained in the course of that discussion are not, however, directly related to the issues raised in this paper, so in what follows I shall set aside the above-mentioned analysis and stick with the non-revised option according to which criteria of identity are semantic-metaphysical principles specifying ontological conditions for statements about identity (i.e. spelling out necessary and sufficient conditions for identity of objects of a certain kind).

It is common to differentiate both between identity conditions and criteria of identity and between criteria in the metaphysical sense and criteria in the evidential sense. Conditions of identity are certain ontological factors that determine or ground identity — they are (intended to be) something in which identity *consists*. In other words, conditions of identity would be interpreted here as truth-conditions of statements about identity. By contrast, criteria of identity are verbalisations (articulations), in an appropriate form, of those conditions. In the light of this distinction, it would be possible, for instance, that something should possess certain conditions of identity, but nonetheless, it would be impossible to formulate corresponding criteria of identity. Next, the difference between criteria in the metaphysical sense and criteria in the evidential sense lies in the fact that while metaphysical criteria spell out conditions of identity (i.e. what is the nature or what are the truth-conditions for certain statements of identity), criteria in the evidential sense provide us with devices for asserting identity — means by which we may recognize identity without characterising its nature.[3] One possible consequence of this difference is the availability of evidential criteria in the absence of relevant metaphysical ones. It is generally expected that criteria of identity should be informative and non-circular, i.e. they should articulate non-trivial information concerning the objects in question, without referring in an overt manner, or tacitly, to the very notion of *identity*. Sometimes, granted that criteria are closely connected with natural kinds, an additional requirement of minimality is added: criteria should only refer to objects of a given kind (and not to objects that belong to this kind as well as to other kinds).

In the current philosophical literature criteria of identity are standardly formulated in the form of necessary and sufficient conditions of identity.[4] Criteria of iden-

[3] For a very useful description of different interpretations of identity criteria, see Fine 2016, Horsten 2010.

[4] Determining both necessary and sufficient conditions differs from specifying conditions that are only necessary or only sufficient. Perhaps we should not *a priori* rule out the possibility, for example, that although it is generally possible, with respect to certain objects, both to formulate necessary conditions of identity and to specify its sufficient conditions, it is still impossible to provide conditions that would be both necessary and sufficient.

tity, as both necessary and sufficient conditions, are additionally divided into so-called one-level and two-level criteria. The form of a one-level criterion is as follows (see Lowe 2009: 16):

(K1) $\forall x \forall y \{[K(x) \wedge K(y)] \rightarrow [x = y \equiv R(x, y)]\}$

(for every two objects x and y belonging to the category K: x is identical with y iff x and y stand in the relation R to another; R must be an equivalence relation)

A two-level criterion can take the form of the following general formula (see e.g. Williamson 2013: 146):

(K2) $\forall x \forall y \{K(x) \wedge K(y) \rightarrow [f_K(x) = f_K(y) \equiv R(x, y)]\}$

(in other words: for every two objects x and y belonging to the category K: the K-function of x is identical with the K-function of y if and only if objects x and y are R-interrelated).

The difference between (K1) and (K2) amounts to the fact that while the identity condition for x and y in (K1) is a certain mutual relation R between them, in (K2) this relation does not directly hold between x and y but between other things appropriately related to x and y (here: functions).

The following formulae are standardly invoked as paradigm examples of criteria of identity: (i) the axiom of extensionality for sets — $\forall x \forall y \{set(x) \wedge set(y) \rightarrow [x = y \equiv \forall z \forall u (z \in x \equiv u \in y)]\}$; (ii) Fregean criterion of identity for directions — $\forall x \forall y \{line(x) \wedge line(y) \rightarrow [(direction\ of\ x = direction\ of\ y) \equiv x$ is parallel to $y]\}$; (iii) Davidson's criterion of identity for events (where all variables range over events) — $\forall x \forall y \forall z \langle x = y \equiv \{[cause(x, z) \equiv cause(y, z)] \wedge [cause(z, x) \equiv cause(z, y)]\}\rangle$ (see Lowe 1997: 620-621; whether (iii) is non-circular is debatable).

It should also be noted that these formulas constitute the schemata of criteria of identity in the synchronic sense: if we wanted to have appropriate schemata of diachronic criteria of identity, we would have to equip them with suitable temporal indices, for example (using the term "person"):

(K1*) $\forall x \forall y \forall t_1 \forall t_2$ (x at t_1 is the same person as y at t_2 iff x at t_1 is related *via* the relation R to y at t_2).

(K2*) $\forall x \forall y \forall t_1 \forall t_2$ {if x is a human being and y is a human being, then the person of x at t_1 is the same person as the person of y at t_2 if and only if x at t_1 is related *via* the R relation to y at t_2}.

Regardless of which of the above formulas is actually preferred, the condition of personal identity is, in each case, constituted by the criterial relation R. It should be noted that R has formal properties very similar to those of identity: it is reflexive, symmetric, and transitive, and so it is an equivalence relation. Nonetheless, it is not

the minimal equivalence relation — as opposed to identity.[5] The last property seems to be very important because it may serve as an additional basis for questioning the metaphysical interpretation of identity criteria: although every criterial relation is an equivalence relation, it cannot be the minimal one: the relation of identity is included in any other equivalence relation but not *vice versa*. For this reason, identity cannot be coextensive with any potential criterial equivalence relation.

In proposing various formulations of criteria of identity, metaphysicians are usually clear that the criteria in question are not:

(a) criteria only in the evidential sense (i.e. purely heuristic or cognitive devices for asserting identity);

(b) definitions of the relation of identity itself;

(c) definitions of the relation of identity as kind-relative (i.e. as a relation relative to a given natural kind);

(d) definitions of natural kinds, entangled in the criteria (see Williamson 2013: 144-145).

At the same time, philosophers clearly indicate that the criteria are semantic or metaphysical in character since they determine *truth-conditions* for statements about identity. Such criteria are intended, as has been mentioned above, to provide conditions in virtue of which objects that satisfy them are identical — or whose satisfaction makes the objects the same. The significance of criteria of identity is additionally highlighted by their role in the procedures of individuation: we can single out and count objects *inter alia* by means of such criteria; in the case of their absence, it can be doubted whether, for instance, a potential counting of objects can be correct (in the case of inability to tell apart the counted objects it would be possible, for example, to count something twice or to treat two different objects as a single unit). Some even claim that criteria of identity ultimately decide on whether something should conclusively be classified as an object in the ontological sense; if no relevant criteria for some entities can be formulated, then those entities either are called *quasi*-objects or are regarded as fundamental and primitive elements of reality (see e.g. Lowe 1994). In any case, a common trend is to interpret the conditions of identity, expressed by criteria of identity in the form of metaphysical-*cum*-semantic principles, as *truth-conditions* for the statements about identity.

The chief objection against this interpretation which I am going to raise, and which is the starting point of the change of optics in this regard, is the following assertion: the truth-conditions for statements about numerical identity can only hold of the very relation of identity, i.e. the obtaining of something what Nathan Salmon calls "the facts that $x = y$" (Salmon 2005: 153-154).

[5] For more on both the logical requirements for criteria of identity and the formal constraints on *R*, see Carrara, Gaio 2011: 227-233. See also Horsten 2010.

Are there any reasons that may support the above account? I think there are. Note, first of all, that if identity is a fully general relation, then any attempt to analyse it as limited to a specific kind-relative domain by means of criteria of identity must itself contain the relation in question. Second, as has been mentioned above, the relation of identity is actually the minimal equivalence relation on any given set, so it cannot be coextensive with any potential criterial equivalence relation. Consequently, neither relations of spatiotemporal continuity, causal continuity, causal dependence, psychological connectedness nor mereological overlap can be conceived of as relations constitutive of identity. Third, the relation of identity seems to be a kind-transcendent one, i.e. it is not limited in its application to the objects of a given kind. If so, then any possible analysis of identity in terms of criteria of identity should also be carried out in a kind-transcendent way. But it is difficult to imagine any more primitive terminology that might be used in such an analysis. Fourth, any potential analysis of identity in the form of criteria of identity must involve quantification over objects of a given domain. Yet, in order to be able to quantify over this domain, one needs to grasp the very notion of identity, which clearly shows that the notion in question is already presupposed by any such analysis. Fifth, the primitiveness of identity is confirmed by definitional practices in logic: definitions of identity almost always take the form of axiomatic definitions which do not involve any other relations apart from identity itself.[6] Last but not least, the vast majority of criteria of identity proposed in philosophical literature have routinely been questioned as being either circular or inadequate.

There are no other facts that could serve as truth-conditions for statements about identity: they cannot be facts other than the identity itself, and so they can be neither spatiotemporal continuities nor causal relations, psychological relations nor any other similar relations. The only truth-condition for the relevant statements of identity is the numerical identity itself. Arguably, one should probably agree that if the relation of identity were interpreted by means of logic, the demand to deliver criteria allegedly indicating what this relation consists in (in the ontological sense) would be fundamentally flawed. Identity is completely primitive, unanalysable, perfectly general, admitting of no degrees, always holding (or not) of necessity, and "kind-transcendent" — regardless of whether it relates to numbers, persons, sentences, or ships.[7]

If this is the case, and I am convinced it is, then any attempt to formulate the criteria of identity in the metaphysical interpretation would be doomed to failure *ab initio*.[8] In the best case, a possible criterion of this type would be either trivial or circular or uninformative, though useful in the procedure of individuation. In the worst case, the very formulation of such a criterion would be, in a sense, simply misconceived since numerical identity — whether synchronic or diachronic — does not

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[6] Some even claim that any attempt to define identity must be circular (Savellos 1990).

[7] For arguments for the thesis that there are no criteria of identity in the metaphysical sense, see e.g. Jubien 1996: 343-356; 2009: 46-54, Merricks 1998: 106-124.

[8] Scepticism of this type, although a more cautious one, is voiced in (Horsten 2010: 416).

consist in any other facts (e.g. the facts that merely accompany identity or are allegedly more fundamental than it).

Therefore, the fundamental element of my interpretation is based on the rejection of an approach according to which criteria of identity are viewed as metaphysical-*cum*-semantic principles specifying *truth-conditions* for statements about identity. The truth-conditions for such statements are always "identity facts", not any other, more fundamental facts. It should immediately be noted that the rejection of this approach does not amount to the rejection of criteria of identity themselves. Firstly, criteria of identity in their trivial or uninformative form still remain the means of individuation. Secondly, these criteria provide the conditions of *application* for both natural kind terms and classificatory general terms. Thirdly, they can play a certain test role in deciding which cognitive elements as a means of evidential testimony should be taken into account in assertions about identity. Consequently, this interpretation preserves almost the entire range of applications of the disputed criteria.

However, if the above approach is right, the question arises as to how one should interpret alleged criteria of diachronic identity formulated for different types of objects. Are all such criteria wrong? It seems that the most appropriate approach would involve the following manoeuvre. Most of the proposed criteria of identity are either of merely evidential character or — if they are formulated in a metaphysical vein — do not pertain to numerical identity at all, except for trivial, uninformative, and circular cases. So what do they apply to in the latter case, if it is not the case of numerical identity? In my view, they are simply formulations of *persistence conditions*, and they are bound with what I would like to call genidentity.[9]

2. MODES OF PERSISTENCE

Roderick M. Chisholm (1969) distinguished two *meanings* of the notion of *identity*: *the loose and popular* and *the strict and philosophical* meaning of the concept.[10]

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[9] This is not the only acceptable interpretation. One can also found accounts according to which identity over time is neither numerical identity nor genidentity, and what is more — it is not any relation in the standard sense at all: it is rather something like a specific mode of existence in time or an ontic aspect which determines the object's unity in time. Due to the lack of other terms, this unity is called identity, but an affinity with identity in the logical sense is rather a matter of loose associations, and it does not stem from the essence of the concept. For more on this latter interpretation, see Piwowarczyk 2010: 142-145.

[10] These are by no means two different notions of *identity*: there is only one notion of *identity*, and its meanings coincide. Identity in the loose and popular sense is no additional variant or kind of identity, nevertheless, by Chisholm's lights, it is precisely this sense that we are accustomed to use in our everyday discourse. From the purely practical point of view, the loose and popular sense of identity is perfectly sufficient when it comes to ordinary language: it turns out that it functions quite well in everyday life. But when we turn to the level of philosophical reflection, then the meaning in question, according to Chisholm, ceases to be satisfactory.

In accordance with the principle of mereological essentialism (Chisholm 1976: 145; 1989: 66),[11] objects persisting over time preserve their identity in the second sense if they do not acquire and do not lose their parts — they are substantial objects, *entia per se*. Objects which constantly lose and acquire parts, as Chisholm says, persist over time preserving their identity only in the loose and popular sense — they are *entia successiva*, *entia per aliud*[12]. I believe that the strict and philosophical sense can safely be reserved here for numerical identity, and the loose and popular sense — for genidentity. Within this interpretation persistence would have two general varieties:

(a) persistence reconstructed in terms of preservation of numerical identity (*via* being wholly present at a succession of different times),[13]

(b) persistence reconstructed by means of the concept of *genidentity*.

As regards criteria of identity, in the first case they could be either regarded solely as a means of individuation or interpreted, in non-trivial instances, purely evidentially. In the second case, those criteria would be criteria of genidentity. They would not be automatically trivial, but their form would depend on, for example, a potential reconstruction of the very concept of *genidentity*. What would such a reconstruction look like? Zdzisław Augustynek (1981) and Eugeniusz Żabski (2008) independently offered some guidance in this direction.

Augustynek proposed a series of axiomatic definitions of genidentity, which have acquired a complete formalisation in my own works (Grygianiec 2005, 2011). The key problem with those formalisations is that they have been formulated in the lan-

[11] According to the doctrine of mereological essentialism, objects have their parts essentially, i.e. for any objects *x* and *y*: if *x* is ever a part of *y*, then *y* is necessarily such that *x* is always a part of *y* if *y* exists; or, to put it another way, if an object were to lose or gain a part, it would cease to exist.

[12] *Entia successiva* are understood here as logical constructions from the objects that constitute them. The constitutive basis of *entia successiva* are, of course, *entia per se*. Each *ens successivum* is ontologically dependent on objects *per se*: at any moment in which there exists some *ens successivum*, there is at least one object *per se* that constitutes this *ens successivum* at that moment; different objects that constitute an *ens successivum* stand in a relation of direct succession (in other words, an *ens successivum* is a temporally ordered collection of the objects which constitute it and are mutually connected by the relation of succession). A given *ens successivum* persists in time, featuring at different times different objects *per se* which constitute it at these times. No *ens successivum* at a given time *t* can be identical in the strict and philosophical sense with any *ens successivum* at a time different from *t*: although *entia successiva* persist through time, they do not retain their identity over time. Successive *quasi*-objects, persisting over time, as Chisholm says, are identical in time only in the loose and popular sense of the word, their identity, however, is not identity in the strict sense but rather is equivalent, taking into account natural language, to relations of succession, similarity, and spatiotemporal continuity.

[13] The concept of *persistence* in the endurantist depiction is defined by the concept of *being wholly present*. However, it should be noted that numerical identity is an indispensable component of the meaning of this concept. This situation could be expressed by the slogan "There is no persistence without identity". For attempts at defining the concept of *being wholly present*, see e.g. Crisp, Smith 2005.

guage of point eventism, and they do not have the hallmark of absolute validity. The most striking example of this fact are Żabski's efforts, who has been inclined — contrary to Augustynek — to interpret genidentity as an intransitive relation.[14] Moreover, the two authors have formulated their axiomatic systems for different ontological categories. Anyway, Augustynek's reconstruction of the concept of genidentity is based on:

(a) the relation of numerical identity,

(b) mutual causal connectibility,

(c) spatiotemporal relations (e.g. temporal continuity).[15]

In providing a reconstruction of the concept of *genidentity* for other ontological categories (not only events), we should, I believe, take into account the same relations. Additionally, in these reconstructions, Chisholmian analyses of the notions of *succession* and *direct succession* could also be employed as a potential conceptual basis of genidentity.[16] A detailed theoretical work in this direction would require separate efforts, which I shall not undertake here.[17] However, we can already conjecture *a priori* that the relation of genidentity should have formal properties very similar to those of identity. If one regards Żabski's approach to the problem of transitivity of genidentity as inappropriate,[18] then genidentity would also be, like identity, an equivalence relation, and so it would enable us to form appropriate equivalence classes. This would be of great metaphysical significance. Objects persisting over time and preserving their numerical identity would be substances in Chisholmian sense, in other words — *entia per se*. Concurrently, objects which persist in time *via* different genidentical timeslices would be *entia per aliud*, namely objects which can be described by means of the concept of an equivalence class as invariant over specific occurrents under certain genidentity relation, or — to put it more specifically —

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[14] Żabski defines the notion of *genidentity* axiomatically (by postulates) using only the said concept and the concept of *logical identity*.

[15] A potential axiomatic system (using the concept of *timeslice of an object*) — one of many possible at this juncture — could look as follows: (1) If any two timeslices of a given object are logically identical, then they are genidentical, simultaneous, and co-local; (2) If any two timeslices of an object are genidentical and simultaneous, then they are co-local; (3) If any two timeslices of an object are genidentical and temporally separated, then they are causally connected (i.e. the first is a cause of the second or *vice versa*); (4) If any two timeslices of an object are causally connected, then they are temporally separated. It is worth noting that the relata of the relation of genidentity are not persisting objects themselves, but their temporal parts or temporal cross-sections of their constituent parts. For this reason, one just should not identify persistence with genidentity — it can be done only in a derivative sense.

[16] About Chisholm's efforts in this regard, see Chisholm 1976: 99-100, 188-189; 1989: 75-79.

[17] Some initial attempts in this direction has already been made in (Grygianiec 2005).

[18] Another possibility is to accept different varieties or grades of genidentity. For historical attempts in this direction, see e.g. Padovani 2013.

under a family of spatiotemporal and causal relations between temporal segments of constitutive objects of the appropriate kind.[19] It would also have to be assumed that anything which is numerically identical would also be genidentical but not *vice versa*. By no means would I want to put the cart before the horse here with regard to ontological decisions, but it can already be envisaged that, as a result, the substantial objects in the relevant sense would prove to be elementary particles, persons, and other ontologically noncomposite objects, whereas the remaining non-substantial objects would include physical bodies, conglomerates, artefacts, and organisms.[20]

I believe that the above interpretation of persistence over time is theoretically better than the previous ones. Firstly, it does not provide a one-sided solution, which would interpret persistence either exclusively in terms of being wholly present and, consequently, of being numerically identical, or solely as something that is constituted by the family of other relations (i.e. as a set of temporal parts appropriately ordered by the mentioned relations). Secondly, it would explain away some opposite

[19] A very similar strategy can be found in (Simons 2000a, b, 2008). See also Brüntrup 2010. Incidentally, on this account, it would be possible to accept the following definition: x is a persisting object $:= x = |q|_G$, where q is a timeslice of a given set of constitutive parts of that object, and G is the relation of genidentity characterised axiomatically. Of course, it is highly debatable whether there is any possibility to identify the timeslices of such a set without any prior reference to the object in question. This could *inter alia* mean that although persisting objects can in principle be characterised in terms of such equivalence classes, they *cannot*, as a matter of fact, *be identified with* those classes. Indeed, identifying persisting material objects with abstract sets is, in any event, highly questionable.

[20] An anonymous referee has voiced some scepticism whether it would be possible, as a matter of fact, to point out genuine examples of Chisholmian cases of diachronic identity in the strict and philosophical sense. Indeed, I fully agree that such examples are contentious and still remain a subject of philosophical controversy. At the same time, however, it may be replied to this that, in the end, some of such examples must be accepted in order to make our concepts of time and change viable. This is clearly illustrated by the following passage from Lowe (1998: 124-125): "So, the three premises of our argument are as follows: (1) time necessarily involves change, (2) a change can only occur if there is something which persists through that change, and (3) if there were nothing whose persistence was ungrounded, then everything's persistence would have to depend upon a succession of changes. From (1) and (2) we can infer that (4) time can only exist if there is something which persists through time. But, also, from (2) we can infer that (5) if anything persists through time, then there is something whose persistence does *not* depend upon a succession of changes. For if *everything's* persistence depended upon a succession of changes, there would be nothing whose persistence *through* change could render those changes possible in the way required by (2). Then, from (5) and (3) we can infer that (6) if anything persists through time, then there is something whose persistence is ungrounded. Finally, from (4) and (6) we can infer that (7) time can only exist if there is something whose persistence is ungrounded". Now, as has been indicated above, possible candidates for objects whose persistence remains ungrounded are some fundamental particles and, perhaps, persons (possibly also other non-composite objects). But we should not, I think, exclude *a priori* the possibility that there are also some composite objects or some of their component parts which persist unchanged for at least some short periods of time. Persistence of the mentioned objects may be regarded, in my opinion, as an acceptable example of strict diachronic identity in the Chisholmian sense.

intuitions that arise within the thought experiments and various possible scenarios considered in the debate on persistence over time. Thirdly, it would let us reconcile opposing verdicts with respect to examples of persistence referred to in the literature, including the commonly known paradoxes. Fourthly, the proposed solution would demand a rather small reinterpretation of criteria of identity — without questioning their individuational and evidential importance. Finally, it would weaken the objection of complete inadequacy concerning a significant part of the discussion on persistence and personal identity (this charge would be rebutted if the discussions on criteria of identity were interpreted as discussions on genidentity criteria). These advantages clearly weigh in favour of the presented interpretation.

CONCLUSION

The restrictive solution, according to which persistence over time is a matter of preservation of numerical identity only (*via* being wholly present), seems wrong. Equally wrong, in my view, is a belief that diachronic identity is entirely reducible to some other basic relations — that it is nothing over and above these relations or simply consists in them. On my account, some objects persist in time because they are wholly present in every moment of their existence and retain their numerical identity (*entia per se*), while other objects persist because they are genidentical (*entia per aliud*). Numerical identity lacks criteria in the metaphysical sense: truth-conditions for identity statements are only facts of identity. By contrast, persistence over time does have metaphysical criteria — these are criteria of genidentity; in that case, the truth-conditions for statements about genidentity are facts of occurrence of some more fundamental relations (including identity). A formulation of a criterion of genidentity consists in providing appropriate truth-conditions in terms of the relations mentioned above. Criteria of identity in the evidential sense preserve their value in both cases, but they are always of cognitive character and pertain to the facts accompanying identity or genidentity (those facts enable us to recognize whether a given object persists over time or not). The existing criteria of identity in the metaphysical vein should be reinterpreted as criteria of persistence, or more accurately — as criteria of genidentity specifying persistence conditions. A potential reconstruction of the concept of *genidentity* for various ontological categories is a separate issue and a task for further philosophical work.[21]

REFERENCES

Augustynek Z. (1981), *Genidentity*, „Dialectics and Humanism" 8, 193-202.
Boniolo G., Carrara M. (2004), *On Biological Identity*, „Biology and Philosophy" 19(3), 443-457.

[21] For an attempt in this direction, see Boniolo, Carrara 2004.

Brower J. E. (2010), *Aristotelian Endurantism. A New Solution to the Problem of Temporary Intrinsics*, „Mind" 119(476), 883-905.

Brüntrup B. (2010), *3,5-Dimensionalismus und Überleben. Ein prozess-ontologischer Ansatz* [in:] *Auferstehung des Leibes — Unsterblichkeit der Seele*, G. Brüntrup, M. Rugel, M. Schwartz (eds.), Stuttgart: Kohlhammer, 245-268.

Carrara M., Gaio S. (2011), *Towards a Formal Account of Identity Criteria* [in:] *Between Logic and Reality. Modeling Inference, Action and Understanding*, M. Trobok, N. Miščević, B. Žarnić (eds.), Dordrecht: Springer, 227-242.

Chisholm R. M. (1969), *The Loose and Popular and the Strict and Philosophical Senses of Identity* [in:] *Perception and Personal Identity*, N. S. Care, R. H. Grimm (eds.), Cleveland, OH: Press of Case Western Reserve University, 82-106.

Chisholm R. M. (1976), *Person and Object. A Metaphysical Study*, La Salle, IL: Open Court.

Chisholm R. M. (1989), *On Metaphysics*, Minneapolis, MN: University of Minnesota Press.

Crisp T. M., Smith D. P. (2005), *'Wholly Present' Defined*, „Philosophy and Phenomenological Research" 71(2), 318-344.

Effingham N. (2012), *Endurance and Perdurance* [in:] *The Continuum Companion to Metaphysics*, N. A. Manson, R. W. Barnard (eds.), London: Bloomsbury, 170-197.

Epstein B. (2012), *Sortals and Criteria of Identity*, „Analysis" 72(3), 474-478.

Fine K. (2016), *Identity Criteria and Ground*, „Philosophical Studies" 173(1), 1-19.

Grygianiec M. (2005), *Variants and Criteria of Genidentity* [in:] *Logic, Methodology and Philosophy of Science at Warsaw University*, vol. 2, A. Brożek, J. J. Jadacki, W Strawiński (eds.), Warszawa: Wydawnictwo Naukowe Semper, 161-171.

Grygianiec M. (2011), *Aksjomatyczne definicje genidentyczności*, „Filozofia Nauki" 19(1) [73], 25-37.

Grygianiec M. (2013), *Kryteria tożsamości osobowej a tak zwany pogląd prosty*, „Ethos" 1, 124-136.

Grygianiec M. (2016), *Criteria of Personal Identity. Reasons Why There Might Not Be Any* [in:] *Myśli o języku, nauce i wartościach. Seria druga. Profesorowi Jackowi Juliuszowi Jadackiemu w 70-tą rocznicę urodzin*, A. Brożek, A. Chybińska, M. Grygianiec, M. Tkaczyk (eds.), Warszawa: Wydawnictwo Naukowe *Semper* [in print].

Haslanger S. (2003), *Persistence through Time* [in:] *The Oxford Handbook of Metaphysics*, M. J. Loux, D. W. Zimmerman (eds.), Oxford: Oxford University Press, 315-354.

Haslanger S. A., Kurtz R. M. (eds.) (2006), *Persistence. Contemporary Readings*, Cambridge, MA: Bradford Books/MIT Press.

Hawley K. (2001), *How Things Persist*, Oxford: Oxford University Press.

Heller M. (1991), *The Ontology of Physical Objects. Four-Dimensional Hunks of Matter*, Cambridge: Cambridge University Press.

Horsten L. (2010), *Impredicative Identity Criteria*, „Philosophy and Phenomenological Research" 80(2), 411-439.

Lewis D. (1986), *On the Plurality of Worlds*, Oxford: Blackwell.

Lowe E. J. (1989), *What is a Criterion of Identity?*, „Philosophical Quarterly" 39(154), 1-29.

Lowe E. J. (1991), *One-Level versus Two-Level Identity Criteria*, „Analysis" 51(4), 192-194.

Lowe E. J. (1994), *Primitive Substances*, „Philosophy and Phenomenological Research" 54(3), 531-552.

Lowe E. J. (1997), *Objects and Criteria of Identity* [in:] *A Companion to the Philosophy of Language*, B. Hale, C. Wright (eds.), Oxford: Blackwell, 613-633.

Lowe E. J. (1998), *The Possibility of Metaphysics. Substance, Identity, and Time*, Oxford: Clarendon.

Lowe E. J. (2008), *How Are Identity Conditions Grounded?* [in:] *Persistence*, C. Kanzian (ed.), Frankfurt: Ontos, 73-89.

Lowe E. J. (2009), *More Kinds of Being. A Further Study of Individuation, Identity, and the Logic of Sortal Terms*. Oxford: Wiley-Blackwell.
Jubien M. (1996), *The Myth of Identity Conditions*, „Philosophical Perspectives" 10, 343-356.
Jubien M. (2009), *Possibility*, Oxford: Oxford University Press.
Merricks T. (1998), *There Are No Criteria of Identity over Time*, „Noûs" 32(1), 106-124.
Noonan H. W. (2007), *Identity Eliminated*, „Analysis" 67(2), 122-127.
Noonan H. W. (2009), *What Is a One-Level Criterion of Identity?*, „Analysis" 69(2), 274-277.
Noonan H. W. (2011), *The Complex and Simple Views of Personal Identity*, „Analysis" 71(1), 72-77.
Oderberg D. S. (1993), *The Metaphysics of Identity over Time*, Basingstoke: Palgrave Macmillan.
Padovani F. (2013), *Genidentity and Topology of Time. Kurt Lewin and Hans Reichenbach* [in:] *The Berlin Group and the Philosophy of Logical Empiricism*, N. Milkov, V. Peckhaus (eds.), Dordrecht: Springer, 97-122.
Piwowarczyk M. (2010), *Paradoks tożsamości w czasie. Uwagi metaontologiczne*, „Studia Philosophica Wratislaviensia" 5(2), 137-152.
Salmon N. U. (2005), *Metaphysics, Mathematics, and Meaning. Philosophical Papers I*, Oxford: Oxford University Press.
Savellos E. E. (1990), *On Defining Identity*, „Notre Dame Journal of Formal Logic" 31(3), 476-484.
Sider T. (2001), *Four-Dimensionalism. An Ontology of Persistence and Time*, Oxford: Oxford University Press.
Simons P. (2000a), *Continuants and Occurrents*, „Proceedings of the Aristotelian Society" 74, 59-75.
Simons P. (2000b), *How to Exist at a Time When You Have No Temporal Parts*, „The Monist" 83(3), 419-436.
Simons P. (2008), *The Thread of Persistence* [in:] *Persistence*, Ch. Kanzian (ed.), Frankfurt: Ontos, 165-183.
Wasserman R. (2016), *Theories of Persistence*, „Philosophical Studies" 173(1), 243-250.
Williamson T. (2013), *Identity and Discrimination*, Oxford: Blackwell.
Żabski E. (2008), *Notka o paradoksie statku Tezeusza oraz identyczności genetycznej*, „Filozofia Nauki" 16(1) [61], 75-82.