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DIVERSITY

CONTENTS

1. Diversity and other Trancendentals

Diversity, more often called numerical difference, is *all-embracing* and ubiquitous. Any entity (existent) of whatever category is diverse from any entity else. Diversity is also ontologically *primary.* All determinations depend upon it. Therefore, it is mistaken to define diversity as qualitative difference. Such a defintion is circular since qualitative difference is nothing but diversity of properties. This may be called into question by someone who conceives of qualitative difference in terms of negation. But he does not realize that a's having a property F and b's not having it make a and b diverse only because having F is diverse from not having F. Diversity is also too basic to be an entity in addition to what is diverse. Two diverse entities are diverse *per se.* This together with the universal scope mentioned above makes diversity a transcendental in the sense of Duns Scotus ([3], I, 8), so called since it transcends the boundaries of all categories.

It follows that, contrary to a customary conception, diversity cannot be a relation, i.e. an entity connected with other entities and in virtue of which they are diverse. I want to show this: assume that diversity is a relation. Then the diversity of any entities (inviduals, properties, relations, etc.) is based on a relational fact which consists at least of those entities and the relation of diversity. Now, as a complex[1] the fact requires the diversity of its constituents. If the relation were not diverse from its relata there would be no relational fact. A complex the constituents of which are all one and the same would be no complex. Each fact presents the diversity of its constituents. This diversity cannot base on another fact. Such a relational fact would present and involve beside the diversity of relation and relata also that between the relata. It would thus include already what it is designed to ground as a whole. An analogous argument can be raised against the grounding of diversity by any complex (e.g. by an ordered pair). The diversity to be grounded is presupposed in the notion of the complex (the elements of the ordered pair do not become diverse by the elementhood of the pair in the diversity-class).

Any attempt to ground diversity ontologically, makes use of it already. This shows that diversity is primary, indeed, and has to be based on the diversa alone. Diversity is not, as I said, an entity in addition to the di-

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[1] For the ontological concept of complex see [5], § 18.

versa. Even a complex which consists of the diversa only, such as Gustav
Bergmann's diad (see [2], p.101ff), is ruled out. Though Bergmann explains
that the diad of diversity is *eo ipso* there, if there are two things, he has to
consider it as a third entity.

My main objection against the diad of diversity is again that being com-
plex it founds on what it should found. Furthermore, I reproach Bergmann
with allowing for diads only for a part of the entities, for what he calls de-
terminates (i.e. particulars, universals, facts, classes, diads), but not for all.
The diversities involving non-determinates remains ontologically unfounded.
And finally, Bergmann's diads grounding the diversity of facts and other
complexes seem to me a repeal of a key principle of ontology, namely that
the diversity of complexes derives from the diversities of their ontological
analyses. Diads of complexes would be underived grounds of their diversity.

The key principle mentioned says in detail that a complex α is diverse
from a complex β iff at least one of the entities of which α consists (either
a proper constituent or a form of it) is diverse from each of the entities of
which β consists. This principle brings together two primary aspects of the
world: diversity and constituency ('being a constituent of'). A third primary
aspect is existence. That it is basic like diversity and no entity can be seen in
a similar way. If existence were added to each entity to ground its existence,
it could, of course, not do its job without existing itself. Hence, the existence
of existence would have to be presupposed. The additional entity existence
would have to be assumed to exist from itself. Again, one would found on
what one wants to found.[2]

And the same is true of the attempt to found on an entity other than the
complex itself that a complex has the constituents it has. If one assumes a
relation of constituency between a complex and its constuents, one grounds
it by the relational fact that a certain entity is constituent of a certain
complex. But in this way one grounds the entities being a constituent of a
certain complex by its being a constituent of another complex (the relational
fact). The latter has to be taken for granted and to be grounded on the
complex itself.

My view is that every complex is per se a sufficient ground for its con-
stituents being its constituents. The constituents are present in the complex,
they are in the complex in a very wide sense of „in". A relation holding be-
tween the complex and its constituents and connecting them by additional
relational facts would be futile. Equally, I think, is every entity itself a suf-

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[2] This applies also to grounding existence on the so-called existential quantifier which,
incidentally, in my view has nothing to do with existence by rather with the mumber one;
see [5], § 4.

ficient ground of its existence and every pair of simple entities a sufficient ground of their diversity. Constituenty, existence, and diversity are the three primary notions which ontology needs to start with.

2. Simple or Complex Individuals

However, there is a strong tendency to think of diversity not as fundamental, but as derived, as derived from disagreement in properties. This conception mainly applies to individuals. And in an ontology in which individuals are analyzed as complexes of properties it is correct. From the key principle stated above follows that if individuals are complexes of their properties two individuals are diverse iff a property of one is diverse from all the properties of the other. Obviously, the diversity of the properties of individuals could be derived in this way only if they consisted for their part of second order properties. And the diversity of some properties had to be non-derived lest diversity in general be lost in an infinite regress. Complexes consist ultimately of simple entities whose diversity is fundamental.

An ontology which analyzes individuals as complexes of properties would get into difficulties with diversity if there were diverse individuals agreeing in all their properties. But even if there were no such individuals, this would not mean that diversity in general is definable in terms of disagreement. Such a definition would leave out diversities between constituents of the same complex as well as of diverse complexes. And it would again define diversity by diversity, the diversity of individuals by the diversity of properties. To reduce diversity in general to disagreement is impossible in any ontology.

There is some irreducible diversity in every ontology, namely the diversity of its simple entities. So in an ontology with simple individuals the diversity of individuals is not derived and independent of their properties. In such an ontology properties are not constituents of individuals but only externally connected with them by being together in facts. Properties are constituents of facts, as are individuals. Hence, the diversity of (nonrelational) facts derives, in part at least, from properties. However, this is not diversity by property disagreement. The facts do not *have* the properties of which they consist like individuals taken to be complexes of their properties.

3. Comparison and Recognition

In order to assess the two types of ontology (those with complex and those with simple individuals), let us examine two kinds of mental processes which

attend to diversity and non-diversity, namely comparison and recognition. When we compare two things we pay attention to their properties, we want to discover agreement and disagreement in properties. But in that process we presuppose the diversity of the things, rather than trying to establish it. This is true at any rate in case we perceive the two things together. In this case it is inconceivable that after finding complete agreement, we conclude that they are really one and non-diverse. Now, if things consisted of their properties, if they were complexes of their properties, we should have to compare those properties to decide about their diversity. Thus ontologies of the first type are at odds with the facts of comparison. The ontologies with simple individuals are in a much better position here. They do not imply that knowledge of diversity arises from comparison and they can explain why the diversity of things is a presupposition. In comparing two things one always attends to the conjunctive fact that a thing a has a property f and the thing b the property g or to the conjunctive fact that the thing a has the property f and the thing b has the property f. One cannot attend to the diversity of a and b or to the diversity of f and g, because there is nothing to attend to. There are not atomic facts of diversity. But by being presented with a and b and with f and g one is also presented with the diversity of a and b and the diversity of f and g.

With regard to the process of recognition, ontologies with simple individuals do not do equally well. That recognition undeniably depends on properties is more in accord with conceiving individuals as complexes of properties. If it is assumed that all properties of individuals are external to them, the question arises why we depend on properties to recognize them. The only possible answer seems to me this: since recognition bases mainly on perception and memory and since the recognized thing is undoubtedly presented in perception, it is not presented in the act of remembering. Otherwise we should recognize it directly and independently of its properties. This answer implies that acts of memory do not have atomic facts containing individuals as their intention[3]. If the act of memory, like that of perception, intended an atomic fact containing the recognized individual, the non-diversity between the perceived and the remembered would be given, too.

What then is the intention of the act of remembering? Though it cannot be a fact containing the recognized individual, it should be some kind of fact. This is a consequence of an ontology with simple individuals. An individual, which does not contain its properties, is too dependent and too

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[3] Traditionally, the opposite term to act is object. Like Bergmann I prefer „intention" because I hold that acts are intentionally related to facts and not to things.

incomplete to constitute the whole intention of a mental act. Also, it is im-
plausible that what one remembers when recognizing concrete things are sep-
arate properties. Obviously, the acts of memory in question have somehow
individualizing intentions. Therefore, I suggest that the facts remembered
in recognition are one-quantifications (costumary but misleadingly called:
unique-existence-quantifications). They have the following form: *for exactly
one x, x is f_1 & ... & x is f_n & x is at place p at time t*, in which $f_1, ..., f_n$
are characteristic properties of x and p at t is the spatio-temporal location
at which the remembering person met x earlier.

Usually, recognition is taken as the realization that the relation of same-
ness holds. When I recognize someone, I realize that a person present now is
the same as a person present to me in the past. But this is a misconception,
if the claim made was correct that diversity and hence also non-diversity or
sameness are not relations. What I realize must hence be something other
than a relational fact.

Starting from an analysis of acts of memory involved in recognition, it
suggests itself to conceive of the recognition of individuals as an inference
(mostly tacit) of the following form:

1. *Individual a has the properties f_1 to f_n.* (premise from perception)
2. *For exactly one x holds that x has properties f_1 to f_n and is at place p
at time t.* (premise from memory)
3. *For exactly one x holds that x has properties f_1 to f_n.* (additional premise)

Conclusion: *a was at p at t.*

The conclusion does not identify (states sameness between) a past and
a present individual, but attributes to the present individual a a relation
in the past. Surely, the schema of inference is simplified. It neglects change.
Quite often the properties given in memory are merely similar to those given
in perception and thus different. But that is a greater difficulty for ontolo-
gies with complex individuals. If individuals consisted of their properties,
diversity of properties would entail diversity of property owner. Ontologies
with complex individuals hardly allow for change in properties, whereas for
simple individuals whose properties are external to them, the exchange of
properties is not a question of diversity or non-diversity. Therefore, I think
that ontologies with simple individuals can not only cope better with com-
parison but also with recognition.

4. Diversity and Difference

I claimed earlier that the reduction of diversity to properties is circular because it terminates in the diversity of properties. This claim of circularity might be called into question. It might be argued that what separates individuals is different from what separates properties from each other. In distinguishing numerical and qualitative difference there is often the suggestion that numerical difference (diversity) is not applicable to qualities, to properties. Actually, a certain relation holds between properties keeping them somehow apart which does not hold between individuals. W. E. Johnson called it „difference" restricting the use of this word somewhat ([4], p. 176). What distinguishes diversity (which Johnson names „otherness") clearly from difference, according to Johnson, is that difference is gradable while diversity is not. Two shades of yellow, e.g., differ less than a yellow and a violet. But no two things are somehow less diverse than two others, even if the former is a spatial part of the latter.

Is the relation of difference equivalent to what I consider as the diversity of properties? No, not all properties which are diverse are also different. For, as Johnson emphasizes ([4], p. 190ff), only properties of the same kind (or in his terminology: only determinates under the same determinable) are comparable in that they have a degree of difference. A shade of colour and certain shape of a body, e.g., or a specific loudness and a specific pitch are not in this way comparable and do not stand in the relation of difference.

Nevertheless, the relation of difference might allow us to reduce diversity non-circularly to properties. In ontologies with complex particulars the diversity of two individuals might be definable thus: two individuals are diverse iff there is difference between their properties. But this definition would not work for disparate individuals, as e.g. a soap bubble and a bang. If they have the same duration, they should be non-diverse since there is no common respect (determinable, to use Johnson's term) in which they could differ.

Johnson's argument for the view that not only individuals but also properties are diverse, is that properties are countable, that number concepts, which he derives from the concept of diversity, are applicable to properties ([4], p. 193).

5. Diversity and Number

This raises the question as to how diversity and number are related. A close relationship is suggested by the designation „numerical difference" meaning

„that difference which is relevant to number". Johnson characterizes the relationship in conceptual terms thus: „When the complementary notions of separateness and togetherness are joined to constitute a unity, there enters the idea of number..."[4].

Note that Johnson considers diversity and togetherness to be complementary. It is important to see that rather than suspending the diversity of its constituents a complex requires it. Diversity and togetherness join to form a complex. This is guaranteed by the dependence of togetherness on diversity. A fusion of elements would no longer exhibit togetherness. In the Aristotelian tradition diversity (taken as separateness or at least separability by God) has been opposed to togetherness.

Now, what Johnson's statement clearly implies concerning the relationship between diversity and number is, first of all, that they are not the same. This is not trivial at all. There is a strong temptation, indeed, to identify diversity with the number 2 and non-diversity (sameness) with the number 1. Bergmann e.g. often explains „being diverse" as „being two and not one"[5]. On the other hand, he does not make the slightest attempt to apply his ontology of numbers to diversity and sameness. There is also the common phrase: „one and the same", which is not meant to say „one and also the same" but rather „being one by being the same" or „being the same by being one".

The quoted statement of Johnson implies further that numbers relate to complexes of objects. The association of numbers to complexes of a certain kind, to classes is obvious and familiar in philosophy. And it seems that the number aspect of a unit-class is correlated with sameness (non-diversity) and the number aspect of the pair class with diversity. That allows us to use the number 2 as a criterion or indicator of diversity, but not to define diversity as twoness. Twoness is an entity[6], while diversity is not.

The question arises why we use an indicator for diversity. We depend on an indicator for something hidden. Diversity, however, cannot be said to be hidden. It is as manifest as anything can be. Yet, it escapes our attempt to grasp it, just because it is not an additional entity to the diversa, just because it is ubiquitous, just because it is a transcendental. That is why we have to intend it by means of a substitute concomitant to it.

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[4] [4], p. XXIII. Separateness is in Johnson synonymous with diversity or otherness, as he calls it.

[5] [1], p. 175. In his last book, though, Bergmann distinguishes the Platonic One and Two from the integers 1 and 2 and defines sameness and diversity in terms of the former without making clear what Platonic numbers are, [2] p. 103.

[6] In my view a form of facts, namely a numerical quantification.

Now, in order to serve its purpose, the entity for which the substitute stands has to be there if the substitute is there. In Johnson's ontology this seems to be the case. If there is the diversity of the things a and b there is also the pair-class of them which has the property of twoness. However, when not only things but also those easily overlooked (and in nominalistic ontologies denied) entities as the characterizing tie between thing and property are considered, it is doubtful that all pairs of entities form a class, e.g., that the characterizing tie and my copy of Johnson's Logic do. Johnson is not explicit on this point.

Remember Bergmann's view mentioned that non-determinates (i.e. entities highly dependent on other entities) do not enter into his diads of diversity. While I am not prepared to hold that non-determinates such as conjunction and negation are not diverse, it appears to me possible to deny that they are two[7]. Hence, I would have to acknowledge diversities to which there corresponds no twoness. The reason why we are nevertheless convinced that they are two could be the difficulty to disentangle diversity and twoness. When we are presented with diversity we associate twoness at once without noticing it. We can do so all the more as the occurrence of diversity without twoness does not prevent us from using the latter as an indicator since it is only a sufficient condition.

References

[1] G. Bergmann, *Logic and Reality*, Madison 1964.

[2] G. Bergmann, *New Foundation for Ontology*, Madison 1992.

[3] J. Duns Scotus, *Opera Omnia*, Paris 1891.

[4] W. E. Johnson, *Logic I*, Cambridge 1921.

[5] E. Tegtmeier, *Grundzüge einer kategorialen Ontologie*, Freiburg 1992.

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[7] I.e. that there is a certain numerically quantified fact with those two forms of facts as proper constituents.