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Aristotle and Individuation

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One of the roles of *matter* in Aristotle's philosophy, according to well-established historical tradition, is to provide a *principle of individuation*. This tradition has been challenged from time to time. Some historians, noting that it is *form* rather than matter that wears the metaphysical trousers for Aristotle, have tried to give form the role of providing a principle of individuation. Others have suggested that there is no such principle at all to be found in Aristotle's works. This ongoing dispute has been frequently flawed by a failure to be sufficiently clear precisely what problem a principle of individuation is supposed to provide an answer to.

Discussions of this topic in recent years have benefitted considerably from the additional attention that has been paid to this question. A number of important distinctions have been made in the literature, and we can best begin by surveying those distinctions.

In a well-known symposium on this topic held some years ago,[1] Jan Lukasiewicz and G.E.M. Anscombe came down on opposite sides of the question whether matter is, for Aristotle, the 'source of individuality,' as Lukasiewicz put it. But their fellow symposiast, Karl Popper, pointed out that Lukasiewicz and Anscombe were actually dealing with two entirely different problems. (Lukasiewicz's formulation of the question, in the lead paper, was obscure enough to be, at best, ambiguous between these two possibilities.) The first problem concerns the *unity* of something that is composed of many parts: what makes the composite thing a single individual, rather than a plurality? The second problem concerns not the unity of an individual, but its distinctness from other individuals: what makes an individual *that* individual, numerically distinct from all other individuals? Lukasiewicz was dealing with the first problem when he answered 'form,' Anscombe with the second when she answered 'matter.' One may say, in answer to the first problem, that this collection of limbs and organs constitutes a single individual (Socrates, say) because of the form or structure that unifies them into a whole; and one may add, quite compatibly, that the individual so constituted is distinct from others of like form or structure (Callias, for example) because of the numerically distinct parcel of matter that composes him.[2] I will follow the common practice of calling an answer to the first problem a *principle of unity* and an answer to the second problem a *principle of individuation*.[3] What I want to discuss here is Aristotle's answer to the second

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1 'Symposium: The Principle of Individuation,' *Proceedings of the Aristotelian Society*, Suppl. Vol. **27** (1953) 69-120

2 This way of putting the point – viz., that the numerical distinctness of two individuals is due to the numerical distinctness of the parcels of matter composing them – makes it clear that Aristotle's point, if it is to be successful, cannot be to provide an *analysis* of the notions of numerical identity and distinctness in general. However, it would not be circular to claim that the numerical distinctness of *material substances* in particular is to be accounted for in terms of the numerical distinctness of their component parcels of matter.

3 We should also distinguish between strong and weak versions of the principle of individuation. The strong version will tell us what makes an individual numerically distinct from all other *possible* individuals; the weak verion need

problem, although I will find it necessary to refer occasionally to his answer to the first problem as well.

Two other distinctions should be introduced, distinctions which cut across one another as well as across the distinction between unity and individuation. The first is between metaphysical and epistemological considerations. There is, for example, the question how one tells one individual apart from another, and the question by what means one is able, on a given occasion, to recognize something as being the same individual that one observed on some prior occasion. These are epistemological questions, and must be distinguished from the metaphysical questions of *what it is* for x and y to be distinct individuals, or to be the same individual. Although there is not likely to be much confusion on this point, it is certainly invited by talk of *criteria* of identity of distinctness. I mention this only to make clear that it is the metaphysical issue I mean to be discussing.

The second distinction concerns temporal perspective. One can raise questions about unity and individuation *synchronically*, at a given time, or *diachronically*, over a stretch of time or between two different times.[4] Thus, the problem of individuation can be given both a synchronic and a diachronic formulation: synchronically, the problem is to say 'what makes one individual different from another at the same time';[5] diachronically, the problem is to say what makes an individual identified at one time the same as, or distinct from, an individual identified at another. Many, although not all, of the authors

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deal only with the question of what marks an individual off from all other *actual* individuals. What suffices as a weak principle of individuation may not be adequate as a strong principle. This distinction will come into play in §II below.

4 The labels are due to Montgomery Furth ('Transtemporal Stability in Aristotelean Substances,' *Journal of Philosophy* 75 [1978] 624-46) although the distinction in temporal perspective can be found in a number of authors: Anscombe; W. Charlton, 'Aristotle and the Principle of Individuation,' *Phronesis* 17 (1972) 239-49; Alan Code, 'What is it to be an individual?', *Journal of Philosophy* 75 (1978) 647-8; Edwin Hartman, *Substance, Body, and Soul* (Princeton, NJ: Princeton University Press 1977), Ch. 2.

5 Charlton, 239

who draw this distinction further allege that it is only the synchronic version to which Aristotle answers 'matter.' But before we consider this allegation, there is a more fundamental issue to be dealt with first. When that has been done (in §§I-III), I will conclude (in §IV) with a few comments on the distinction between synchronic and diachronic versions of the problem.

I

The more fundamental issue is whether Aristotle ever posed the problem of individuation at all. W. Charlton, in a recent article,[6] has argued that there is little reason to believe that he did. In particular, Charlton argues, the passages in which Aristotle has been alleged to maintain that matter is the principle of individuation are not about individuation at all, and hence provide no reason for thinking that Aristotle ever proposed matter as the principle of individuation.

Two passages in particular have been made to bear the weight of the claim that, for Aristotle, matter individuates. The first of these is in *Metaphysics* Δ.6 (1016b31-2):

> Again, some things are one in respect of number, some in respect of form, some in respect of genus, some in respect of analogy: in number things whose matter is one, in form things whose formula is one, in genus things whose figure of predication is the same, in respect of analogy any things related as are two further things. [Kirwan translation]

On the orthodox interpretation, Aristotle is maintaining that x and y are numerically identical ('one in respect of number') if, and only if, the matter of x and the matter of y are 'one' (i.e., x and y have the same matter). And this does, indeed, seem a plausible way to read Aristotle's text. But Charlton proposes an altogether different reading.

Charlton points out, quite correctly, that the rest of Δ.6 concerns unity, not individuation. Thus, the orthodox interpretation requires

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6 Charlton, cited in n. 4 above

our lines to be 'intrusive.'[7] On Charlton's reading, the lines, in keeping with the rest of the chapter, concern[8]

> the unity of an individual continuous whole. Two thighs would be one in species, because their definition is one; a single thigh is one because the bone in it, its matter, is continuous.

On Charlton's reading, then, Aristotle's point is that x is one individual if, and only if, x's matter is continuous (i.e., without gaps), or perhaps that x and y together make up a single individual if, and only if, the matter of x is continuous with the matter of y.

I have offered two ways of construing Aristotle's point, on Charlton's reading of it, because Charlton himself does not make clear whether he takes Aristotle to be explicating the one-place predicate 'x is one in respect of number' or the two-place predicate 'x is one with y in respect of number.' If the one-place reading could be sustained, then Charlton would almost surely be correct in his contention that the passage is about unity, rather than individuation. For there does not seem to be any way to construe a formula beginning 'x is one in number if ...' as being about identity and individuation.

But while the one-place reading seems possible for Aristotle's formulation ('things are one in number whose matter is one') taken by itself, it does not seem possible when we consider the entire paragraph in which that formulation occurs. Aristotle is, by anyone's account, distinguishing oneness in number from oneness in other respects. The general schema he is interested in, then, will be one of the following two:

i) x is one in respect of φ, or

ii) x is one with y in respect of φ,

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7 So called by C. Kirwan, *Aristotle's Metaphysics Books* Γ, Δ, and E (Oxford: Oxford University Press 1971) 139.

8 Charlton, 243

for variable φ. But (ii) provides the only plausible way of reading Aristotle's characterizations of oneness in the *other* respects: form, genus, and analogy.

Consider his claim at 1016a24-7: 'Things are called one whose genus is one ... as for instance a horse, a man, and a dog are one something because all animals.' The point is not that each of the species *horse*, *man*, and *dog* is one in genus – which is trivially true of any species if 'genus' is taken strictly and trivially false if it is taken loosely – but that these species (or their specimens) are all (generically) one *with one another* because they all belong to the same genus. So (ii) is the general schema Aristotle is interested in; it is the two-place predicate '*x* is one with *y* in respect of number' that he means to explicate. This point, while it does not clinch the case for the traditional interpretation, at least keeps it in the running.

Charlton is certainly right to insist that we consider our passage within the larger context in which it occurs. But when we do so we see that his interpretation does not fit in so smoothly as he would like us to think. For on Charlton's reading, Aristotle would be making a point about unity and continuity which conflicts with what he said just twenty lines earlier. The earlier passage reads:

> Although in a way we assert that anything whatever is one which is a quantity and continuous, in a way we do not if it is not some kind of whole, that is, if it does not possess one form. (1016b11-13)

Aristotle goes on to give the example of a single shoe: if its parts were put together just any old way (ὁπῶσουν) we might, in a sense, count them as one on grounds of their continuity, but in another sense we would do so 'only if they were put together in such a way as to be a shoe and thereby possess some one form' (1016b16-17). If Aristotle is here distinguishing two senses in which component parts can be said to constitute some *one* thing, it is clear that only one of these, the weaker, can be explicated in terms of simple material continuity. The stronger sense requires that the components go together to make up something that is one in form. Clearly, Aristotle is here supposing that the unity that comes from material continuity does not entail the unity that comes from form.

But immediately after the crucial lines where Aristotle

distinguishes the four respects in which things can be one, he makes a claim about the implication relations among these respects:

> In every case the earlier imply the later, as for instance what is one in number is also one in form but what is one in form is not all [one] in number ... [1016b35-37; Kirwan translation, amended]

It is obvious, then, that Aristotle cannot here be explicating unity in number in terms of continuity of matter, since he says that the first, but not the second, entails oneness of form. If x is one part of a shoe and y is another, and x and y are fused haphazardly into a whole, then x and y are *not* one in form, either in the sense that x is a shoe and y is a shoe, or in the sense that what x and y go together to make up is a shoe. they are one only in the weaker sense of making up a materially continuous whole. But they cannot be things 'whose matter is one' in the sense in which Aristotle uses this phrase at 1016b32. So Charlton's reading cannot be right unless Aristotle is guilty of a glaring inconsistency in the space of twenty lines.

The orthodox interpretation, it should be noted, has no difficulty on this score. Aristotle's point at b31-2 is not about the unity of the component parts of a complex whole, but about *counting*. If x and y are one in number, Aristotle maintains, they are one in form, but not conversely. For example, x and y may be one in form in that x is a shoe and y is a shoe. When, we may ask, are x and y one in number, i.e., what would make x and y *one shoe*? Aristotle's answer is that their matter must be one. Clearly, for their matter to be one is not, here at any rate, for it to be continuous, lest a pair of shoes fused at the soles count as one shoe. Equally clearly, being one in number entails being one in form, since x and y cannot be one (and the same) shoe unless x is a shoe and y is a shoe. I conclude that the orthodox interpretation makes better sense of our lines than does Charlton's alternative.

The other star passage for matter as principle of individuation is in *Metaphysics* Z.8, at 1034a5-8:[9]

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9 Furth, 643

> When once the whole exists, thus-and-such a form in these here flesh and bones, that's Callias, or Socrates; and they're different on account of their matter (for that's different), but the same in form (for the form is indivisible). [Furth translation, loc. cit.]

On the orthodox interpretation, Aristotle's point here is that cospecific individuals, such as Callias and Socrates, are two numerically distinct individuals not because of any difference in form (=species: for they are both men) but because of a difference in their matter. Furth, a spokesman for orthodoxy on this point, at least, puts it quite graphically:[10]

> [T]he same specific form is here seen to be impressed on neighboring but nonoverlapping regions of matter, thus stamping out Callias and Socrates, respectively.

Charlton counters the orthodox view by claiming that the passage may at least as plausibly be taken to be raising the epistemological question how one tells cospecific individuals apart, and answering it in terms of a criterion of qualitative difference. 'Different' (ἕτερον) would then be taken to mean 'qualitatively different' rather than 'numerically different' in our passage, which would, so interpreted, have nothing to do with the metaphysical issue of individuation. The point would be, rather, that it is a qualitative difference between the *matter* composing one individual and that composing another of the same species that enables us to tell them apart. In support of this reading, Charlton appeals to *Metaphysics* I.9 (1058b1-11), where Aristotle claims that qualitative differences that do not make things different in species, such as the difference between pallor and darkness, are differences in matter rather than in definition. 'Different matter' in this context can only mean 'qualitatively different matter', e.g., pale flesh vs. dark flesh. And, as Charlton notes,[11]

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10 Ibid.

11 Charlton, 244

> [t]he language and examples here (ἄτομον, λευκότης, σάρκες, καλλίας) echo the Met. Z passage to such an extent that it is reasonable to suppose Aristotle has the same things in mind in both.

Charlton's supposition is certainly reasonable, but it is not without difficulties of its own. For there is nothing in Z.8 to suggest that Aristotle has epistemological considerations in mind. The chapter concerns the generation of substantial individuals, both natural and artifactual, and the relations among matter, form, and the compound of the two. Epistemological considerations in Z.8 would seem intrusive.

But even if Charlton is wrong in supposing that it is the epistemological question that is being raised, he may still be right in taking ἕτερον to mean 'qualitatively different.' Two interpretations along these lines are possible. 1) Aristotle might be addressing the metaphysical problem of individuation, but answering it in terms of a criterion of qualitative sameness and difference. According to this interpretation, Aristotle would be claiming that numerically distinct cospecific individuals always differ in being composed of qualitatively different matter. However plausibly Aristotelian this would be as a principle of individuation,[12] it has little plausibility as a reading of 1034a5-8. For it requires one occurrence of ἕτερον to mean 'numerically different' and another, only five words later in the same sentence, to mean 'qualitatively different.'

2) A more plausible interpretation along these lines takes ἕτερον to mean 'qualitatively different' throughout, but construes the issue as being metaphysical, not epistemological.[13] Aristotle's point would then be that a qualitative difference between cospecific individuals *consists in* a qualitative difference in their matter. This reading avoids the objection raised above to (1) but still takes the point of 1034a5-8 not to be about individuation at all.

However, there is some evidence elsewhere in Z.8 that it is

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12 I will touch on this question in §II below.

13 I am grateful to Alan Code for pointing out this possibility to me; I thank him also for providing many helpful comments on an earlier draft of this paper.

numerical, rather than qualitative, identity and difference that is on Aristotle's mind in the chapter. Thus, ten lines earlier, at 1033b29-32, he writes:

> In some cases indeed it is even obvious that the begetter is of the same kind as the begotten (not, however, the same nor one in number, but in form), i.e., in the case of natural products (for man begets man) ... [Ross translation]

Aristotle's point is that, among natural substances (plants and animals), begetter and begotten are numerically distinct cospecific individuals, the same in form but not in number. It would be natural for him, having pointed this out, to go on to elaborate on what the sameness consists in and what the difference consists in. 1034a5-8 provides the elaboration. The sameness of form consists in the form's being indivisible ἄτομον); the difference in number consists in a difference in matter.

Even if Charlton's heterodox readings of our two passages are not persuasive, as I think they are not, the effect of his paper is still salutary, for it reminds us how rarely Aristotle even seems to be asserting that matter is the principle of individuation. If the orthodox reading of our two passages is correct, then Aristotle has asserted an important principle whose application, if not enunciation, we should surely expect to find in appropriate places in his works. If we can find doctrines of his which depend on it, or passages in which he is plainly relying on it, we will have the best sort of evidence we can, under the circumstances, for attributing the principle to him. In the next two sections I will consider some doctrines and passages which seem to me to have the best chance of providing such evidence.

II

A dominant theme in *Metaphysics* Z is that definition is of the *form* or *species*: there are no definitions of individuals.[14] By this Aristotle does not, of course, mean that if a formula such as 'rational biped' defines a species, it cannot therefore apply to any individual, e.g., Socrates. Surely, Aristotle thinks that it can. The claim is, rather, that no definition can be used to *individuate*: none can be produced that will apply to, e.g., Socrates, that will not apply to others of his kind. Thus, between Socrates and Callias, there is no difference in definition.

But Aristotle also regards individual substances as hylomorphic compounds; and form, or essence, the ontological correlate of the *definiens* of a correct definition of a substance,[15] is what such compounds share when they are cospecific. Aristotle at times puts this point graphically, if somewhat misleadingly, by saying that an individual is *definition plus matter*.[16] Thus, the difference between two cospecific individuals, such as Socrates and Callias, is a difference in their matter.

But what kind of difference? The difference between the matter of Socrates and the matter of Callias might be a qualitative one[17] (in color, shape, etc.) or a quantitative one (in bulk, size, etc.) rather than just the numerical difference that the principle requires. If one can individuate by means of *accidents*, then it would be reasonable for Aristotle to describe the difference in accidents as a difference in matter, since he regards matter as the source of all accidents (cf. *Met. E.2*, 1027a13). But this would fall short of an endorsement of or commitment to the traditional principle, according to which a difference in

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14 Stated explicitly in *Met. Z.15* (1039b26ff) and *Z.10* (1036a2-8), and supported also by *Z.11* (1036a28-9, 1037a28) and by *Z.4* (1030a2-16).

15 I owe this felicitous way of expressing the relation between essence and definition to Alan Code. Cf. his 'Aristotle: Essence and Accident,' in R.E. Grandy and R. Warner, eds., *Philosophical Grounds of Rationality: Intentions, Categories, Ends* (Oxford: Oxford University Press forthcoming).

16 Cf. *Met.* I.9 (1058b10), Z.11 (1037a1-2, 1037a29), and Z.15 (1039b21).

17 As envisaged in the interpretation of 1034a5-8 that was rejected in §I above.

matter is supposed to distinguish even qualitatively identical cospecific individuals, i.e., individuals which differ *solo numero*.

I think we can get some enlightenment on this point by examining a passage in *Metaphysics* Z.15 in which Aristotle argues for the indefinability of individuals. At 1040a28ff Aristotle tries to explain why the fact that some kinds have *unique* instances does not consititute a counterexample to the thesis that there are no definitions of individuals. The point, he thinks, is easily missed in the case of something eternal[18] and unique, such as the sun or the moon. One may have a formula that applies uniquely to the sun, let us say, and think that it therefore qualifies as a definition of an individual. But such a formula will fail for one of two reasons. 1) It may include attributes peculiar to the sun, but 'whose removal the sun would survive' (1040a31). Thus, the formula 'night-hidden orbiter of the earth' applies uniquely to the sun, but cannot be its definition. For the sun might stand still or become visible at night without ceasing to be the sun, i.e., without ceasing to be the same substantial individual (οὐσίαν τινὰ). 2) It may *in fact* apply uniquely to the sun, but possibly apply to something else. 'If another thing,' Aristotle writes, 'with the stated attributes comes into existence, clearly it will be a sun [i.e., according to the proposed definition]. But,' he goes on, 'the sun was supposed to be an individual (τῶν καθ' ἕκαστα), like Cleon or Socrates.' Thus, the proposed *definiens*, 'night-hidden orbiter,' fails for the second reason, as well. A second celestial body that (as Aristotle supposes) orbits the earth but cannot be seen at night would not also be *that* individual that the definition proposed to define. As Aristotle puts it, 'the formula is general (κοινός),' that is to say, is applicable, at least in principle, to more than one thing, and cannot therefore be a definition of an individual. This argument against the possibility of defining individuals, which I will call the *duplication argument*, is the one I want to concentrate on.

The duplication argument contends that one can overturn a proposed definition purporting to define an individual by showing that

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18 The relevance of eternality to the question is that Aristotle thinks that one objection to the notion that there can be definitions of individuals is that material individuals are typically perishable and thus not suitable *definienda*; but this need not detain us here.

there could be *another* individual that also satisfies the *definiens*. But how are these two individuals to be distinguished from one another? Aristotle here seems to face the following dilemma. If we can distinguish between two individuals, x and y, then we can simply add to the proposed *definiens* (which is presumably a formula that applies to x and to y but to nothing else), reference to whatever it is that we use to distinguish them. We would then seem to have a new formula that applies to one, but not to the other, and which would thus seem to qualify as a definition of an individual. But if we cannot distinguish between the two, it is not clear that we have a counterexample to the definition originally proposed.

Thus, suppose we try to apply the duplication argument to Aristotle's example. We point out that although there is, in fact, only one night-hidden orbiter, there might very well have been two. These two night-hidden orbiters cannot both be *the* sun. But, of course, there will be some difference between the two; one of them is larger, for example. In that case we may amend the *definiens* to read 'largest night-hidden orbiter.' There cannot very well be two of *those*. So we have very quickly arrived at a formula which applies to only one individual but seems to be immune to the duplication argument.

One response on Aristotle's behalf would be to point out that this argument was not supposed to provide the only way of overturning proposed definitions of individuals. He can still fall back on his other objection that the proposed definition wrongly imports an accident which is not essential to its *definiendum*. So 'largest night-hidden orbiter' fails to define an individual not because it might apply to two things, but because it imports attributes that are only accidental to the one thing that it applies to.

But I think that this response, although it is based on a plausible reading of the conclusion of Z.15, misconstrues the force of the duplication argument. For Aristotle reminds us here that the formula (λόγος) that fell to the duplication argument did so because it was shown to be general (κοινός). But he has already claimed (Z.11: 1036a28-9) that a definition (ὁρισμός) is of the universal (καθόλου); and Z.13 reiterates the familiar idea that a universal is general and capable of belonging to many things (1038b11-12). So one might expect Aristotle to hold that any general formula that restricts itself to universals can apply to more than one thing, and that *that* is why

there can be no definitions of individuals. This would give Aristotle a much stronger objection to the idea that individuals can be defined. But it would also require him to be able to use the duplication argument against any formula purporting to define an individual.

The only reason so far adduced for supposing that the duplication argument might fail to overturn some such formula has been this: whereas some descriptions are just as a matter of fact uniquely instantiated (e.g., 'natural satellite of the earth') some are logically incapable of being multiply instantiated (e.g., 'first man to walk on the surface of the moon'). And it is only the former that seem to be vulnerable to the duplication argument.

Still, it would be wrong to suppose that the description 'the first man to walk on the surface of the moon' could be a 'definition' of Neil Armstrong. And the reason is not that there might somehow have been *two* men, each of whom was first to walk on the moon. Rather, it is that Armstrong needn't have been the first to perform this feat; if things had gone differently, a different man might have had the honor.

I believe that we now have a notion of duplication that better fits the needs of Aristotle's argument. Rather than imagining that there might be an additional bearer of a description, alongside the actual bearer, Aristotle may be imagining that there might have been an alternative bearer, instead of the actual one. If so, he will have at his disposal a principle which can be used to rule out a much wider range of proposed definitions of individuals:

(D) For any formula, F, which in fact applies uniquely to x, there might have been a distinct individual, y, uniquely satisfying F.

He will have something else, as well. For it is a direct consequence of (D) that, at least among possible individuals, there cannot be an adequate principle of individuation based on accidents (without reference to matter). If there were such a way of individuating among possible individuals, there would be a formula (containing reference to the accidents that individuate) that could serve as a definition of some possible individual. So since (D), which we are now supposing to underlie the duplication argument, rules out such definitions, it also

rules out the possibility of individuation in terms of accidents. The 'different matter' that does the individuating on Aristotle's account cannot be relied upon, then, to be qualitatively different matter, and the traditional conception of matter as individuator seems to be (at least partially[19]) vindicated.

III

The consequences of (D) seem well enough established, but its credentials as an Aristotelian doctrine may still seem in doubt. Since reading it into Z.15 may seem too far-fetched, I will now try to buttress that reading by bringing into play a passage in *De Caelo I.9*, in which Aristotle, in considering another use of the duplication principle, provides some clarification of it.

In this chapter, Aristotle attempts to show not only that there is in fact just one universe, but that there could not be more than one (οὐ μόνον εἷς ἐστίν οὐρανός, ἀλλὰ καὶ ἀδύνατον γενέσθαι πλείους, 277b27-8). The first thing that is instructive for our purposes is the reason that he gives for finding the case problematic. We distinguish, he says, between form by itself (αὐτὴ καθ' αὑτὴν ἡ μορφὴ) and form combined with matter (μεμιγμένη μετὰ τῆς ὕλης). And we draw this distinction even when, as it happens, the form has only one instance. Now the universe, being a perceptible thing, is a material individual (τῶν καθ'

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19 It is only if we require the principle to individuate among all possible individuals that we can be forced by this argument to interpret it along traditional lines. (D), the principle I take to underlie the duplication argument, cannot rule out the possibility that, for any pair of distinct *actual* individuals, there is some accident that discerns them.

On the other hand, if Aristotle's interest is in individuation among possible individuals, we can see why he would not be able to appeal to the accident of *spatial location* to individuate. For while any distinct actual contemporaries will differ in spatial location, this need not be so for distinct possible contemporaries. (E.g., this table is not distinguishable in location from another possible table that would have been here had a different batch of lumber been used to make a table for this room.)

ἕκαστον ... ἐν τῇ ὕλῃ); so we must distinguish between *universe in general* (οὐρανὸς ἁπλῶς), which is a form, and the material individual, *this universe* (ὅδε ὁ οὐρανὸς). The problem, however, is this: 'any shape or form has, or may have, more than one particular instance' (ὧν δ' ἐστὶ μορφή τις καὶ εἶδος, ἤτοι ἔστιν ἢ ἐνδέχεται πλείω γενέσθαι τὰ καθ' ἕκαστα, 278a15-16). So it seems that there either are, or may be, more universes than this one.

The principle underlying this problematic argument bears a striking resemblance to the one on which the duplication argument of *Z.15* rests. It would not be surprising if it were the same principle. Form is repeatable, Aristotle points out here, just as a definition (a formula stating the essence or form of a thing) is always capable of applying to different instances from the ones it in fact applies to. The problem that Aristotle now faces is that a principle he endorses, or at least a variant of it, seems to lead to a conclusion that he rejects, viz., that there can be more than one universe.

Aristotle will not accept the objectionable conclusion: there could not, he insists, be more than one universe. But he does not feel compelled to abandon the principle that seemed to lead to it. What he does instead is to show that the objectionable conclusion does not follow (278a26-7): the duplication principle cited here does not entail that there might be a plurality of universes.

Before going on to look at Aristotle's attempt to evade the unwanted conclusion, we might consider, in passing, how (D) fares on this score. Since (D) does not claim that 'universe' (or whatever formula is proposed as its *definiens*) can be multiply (simultaneously) instantiated, it does not require that there might be, à la David Lewis, distinct contemporary worlds that are equally real. It only requires that we be able to make sense of the possibility that there might have been a (unique) universe different from *this universe*, the one there actually is. Since any friend of possible worlds will regard this as relatively unproblematic, while any foe is likely to find it hopelessly unintelligible, I will not try to argue the case. Suffice it to say that if (D) is compatible with Aristotle's contention that there cannot be more than one universe, this is prima facie evidence in favor of (D) as a construal of the principle of duplication in Z.15.

Aristotle presents his argument against a plurality of universes in the form of a fanciful analogy. If all the flesh in the world were to

come together to make up one nose, he tells us, then no additional noses could come into being. For flesh is the matter of noses, and no material substance can come to be in the absence of the matter appropriate to a thing of that sort. Now the universe is a material individual (τῶν καθ' ἕκαστα καὶ τῶν ἐκ τῆς ὕλης). And it is made of not just a part, but *all* the matter there is; thus, there is no matter available to make up another universe and mark it off from the actual one. So one universe is all we have, and all we can have.[20]

It is obvious that nothing Aristotle says here rules out the possibility that there might have been a different universe from the one that, in fact, there is; all that is ruled out is an actual or possible *plurality* of universes. But, on the other hand, nothing we have yet seen shows that Aristotle is here committed to that possibility, either. If this could be shown, we would have independent support for our interpretation of the duplication principle of Z.15.

At the conclusion of his proof of the uniqueness of the universe, Aristotle makes a striking remark. Although he thinks he has just shown that, necessarily, the universe is unique, he still maintains that 'the being of *universe* itself is different from that of *this universe*' (τὸ μὲν εἶναι αὐτῷ οὐρανῷ καὶ τῷδε τῷ οὐρανῷ ἕτερόν ἐστιν, 278b5-6). Why does he say this? Presumably, because *universe* itself is a form, and *this universe* an individual material object (albeit a large one), form compounded with matter. But what does this difference amount to? It cannot be just the usual contrast between repeatable form and unrepeatable individual, for in this case, it would seem, neither is repeatable. There is only one universe, Aristotle tells us, and there cannot be more than one.

To put the same point another way: consider the definition of *universe*[21] that Aristotle provides in the very next paragraph of the chapter. *Universe*, he tells us, means *the totality of body within the celestial sphere.*[22] But this definition seems to apply to *this* universe,

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20 Aristotle's analogy is slightly more elaborate than this. But the simplified version presented here contains all the essential ingredients.

21 The third definition of οὐρανός seems to specify the sense that is relevant to Aristotle's discussion of uniqueness, and so it is the one I will consider here.

22 ἔτι δ' ἄλλως λέγομεν οὐρανὸν τὸ περιεχόμενον σῶμα ὑπὸ τῆς ἐσχάτης περιφορᾶς. τὸ γὰρ

and to nothing else; why, then, is the definition of *universe* not a definition of *this universe*? After all, this universe is the totality of body within the celestial sphere, and no other material individual is, or can be, the totality of body within the celestial sphere. Clearly, Aristotle cannot answer that *this universe* has a definition different from that of *universe*, ἁπλῶς; for an individual, like *this universe*, is not supposed to have a definition of its own. Thus, the distinction Aristotle wants to draw between *the being of universe* and *the being of this universe* cannot be made out by appeal to a difference in definitions. If *this universe* has a definition at all, it is the definition of *universe*, ἁπλῶς.

It must, then, be the *matter* that this universe is composed of that makes the difference between *being this universe* and *being a universe*. (Recall that the reason there can't be any more universes is that there's no more matter for them to be made of.) To be a universe is to be the totality of body within the celestial sphere; but not just any totality of body within the celestial sphere would be *this* universe. To be *this* universe is to be the totality of *this* body (i.e., *this* matter) that there actually is within the sphere. If there had been different matter from the matter that in fact composes the universe, there would still have been a unique universe, satisfying the definition of *universe* – but it would not have been *this* universe.[23]

Aristotle's distinction between *being a universe* and *being this universe*, then, depends upon the assumption that the first of these properties, unlike the second, might have had a different bearer. But this is exactly what we would expect a proponent of (D) to maintain. For (D) tells us that every formula (i.e., every candidate definition) might have applied to a different object. So while there is a definition

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ὅλον καὶ τὸ πᾶν εἰώθαμεν λέγειν οὐρανόν, 278b18-21. I have altered the wording of the definition somewhat to facilitate the discussion. I hope I have not distorted its sense.

23 The point may be put (anachronistically, to be sure) in this Kripkean way: *universe* can be defined by the definite description 'the totality of matter within the celestial sphere' so long as that description is understood to be a non-rigid designator. But 'this universe' is a rigid designator, and so cannot be defined in the same way.

of *universe*, it might have applied to something else, and so does not individuate. But there is no λόγος for *this universe*, since if there were, it would have to apply in principle to something else, as well. But nothing else could have been *this universe*. And that is why *this universe*, like all other individuals, is not definable.[24] What makes it *this universe* is that it is the totality of *this* body (i.e., all the body there actually is). Its individuality, or *thisness*, and hence its indefinability, is thus the contribution of its matter.[25]

IV

It is typical of living organisms, and even occasionally true of artifacts, that one and the same individual persists through time in spite of being composed of numerically different batches of matter from time to time. This fact may seem to to count against the claim of matter to be the principle of individuation. And Aristotle's recognition[26] of the possibility of such cases of persistence likewise seems to count against interpreting him to have made such a claim.

In response to these considerations, several authors have maintained that Aristotle takes matter to be the principle of individuation only on the *synchronic* version of the principle. '[C]learly,' Anscombe says,

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24 I am assuming that it is the presence of the indexical 'this' in the description 'the totality of *this* body' that prevents it from counting as a λόγος that Aristotle might have to accept as a definition. (The presence of a proper name would be similarly disqualificatory.)

25 There is an obvious connection between *matter* and *thisness* for Aristotle. The unknowability (cf. 1036a8) and indefiniteness (cf. 1037a27) of matter, and its banishment from proper definitions (cf. 1035b33, 1036b5-6) that we find in Z.10 and 11 may thus be due more to its purely indexical role than to anything else. More work needs to be done investigating this connection in Aristotle's metaphysics.

26 Well documented by Hartman, 59-60.

commenting on the passage in Z.8 that we considered earlier, 'what is in question here is contemporaries,'[27] and Furth echoes [28]

> that Aristotle is thinking of these two as taken *simultaneously*, and accordingly pointing to their divergent materials as of this moment.

At this point it is tempting to ask what Aristotle took to be the principle of *diachronic* individuation, and both Anscombe and Furth succumb to the temptation. What Anscombe has to say is not totally clear, but Furth is quite straightforward:[29]

> [T]he "principle of diachronic individuation" in the sense of the source of the transtemporal unity of a single individual, is form.

But Alan Code[30] has located a difficulty in Furth's answer. If x is an individual identified at time t_1 and y an individual identified at time t_2, and the form of x is identical to the form of y, it certainly does not follow that x and y are numerically the same individual. The form of a substantial individual is its *specific* form, and this cannot individuate diachronically any more than it can synchronically.[31]

Code suggests, quite plausibly, that when Furth introduces diachronic considerations, he slips into thinking about the principle of unity, rather than about the principle of individuation. There is, to be sure, a synchronic principle which is matter, and a diachronic principle which is form; but it is only the first which has been shown to be a

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27 Anscombe, 94

28 Furth, 643

29 Furth, 644

30 Code, cited in n. 4 above

31 Those who believe that Aristotle had a notion of *individual* forms would be likely to invoke them at this point in an attempt to provide Aristotle with a satisfactory principle of diachronic individuation. (For an interesting exception, cf. Hartman, Ch. 2, *passim*, esp. p. 84.) I think it unlikely that Aristotle countenanced such entities; but the topic is too large to be considered within the confines of the present paper.

principle of individuation. To be an individual at all a thing must exemplify a form, and so to *continue* to be an individual it must continue to exemplify a form. But nothing follows from this about identity and individuation.

If this objection can be sustained, we seem to be left with these, almost entirely negative, results: although sameness of form may be a necessary condition of identity for temporally disparate individuals,[32] it is not a sufficient condition. And whether or not sameness of matter for such individuals is a sufficient condition of identity (a question we will consider shortly), it is certainly not a necessary condition. So it appears not only that neither matter nor form alone can individuate diachronically, but also that a principle of diachronic individuation cannot be constructed out of some combination of the two.

But Code thinks that something remains to be said for matter as the principle of diachronic individuation, and, following a suggestion of Jonathan Bennett, constructs such a principle out of Aristotelian materials. The idea is this: just as cospecific individuals x and y are identical at a given time if, and only if, they have the same matter at that time, so x and y continue to be identical over time if, and only if, they *continue* to have the same matter *as one another*. Thus, a principle of identity and diversity for temporally disparate cospecific individuals x and y can be formulated in terms of the (spatio-temporal) *continuity* of the matter composing x with the matter composing y.

I think that this answer is correct so far as it goes. But it is important to recognize its limitations. First, Code wisely restricts the applicability of this principle to the case of substantial biological individuals. The tiger you saw yesterday is, indeed, identical to the tiger I saw today just in case your tiger and mine satisfy Code's condition of spatio-temporal continuity. But the case is otherwise with artifacts. Suppose a statue of Socrates is melted down, and its component bronze recast as a shield during wartime. After the hostilities, the shield is melted down and a different sculptor recasts it as a statue – but this time of the commanding general of the victorious army. The

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32 Furth colorfully describes this as the 'migration resistance' condition. Cf. *Topics* 125b37-9 and 145a3-12 for the evidence that it is to be found in Aristotle.

pre-war and post-war statues are clearly not one and the same statue. The statue of Socrates has not merely been altered; it has ceased to exist. Yet the two statues satisfy the principle of spatio-temporal continuity and are co-specific.[33] What is more, they are even made of the same batch of bronze. So neither continuity nor even sameness of matter appears to be a sufficient condition of diachronic identity for cospecific artifacts.[34]

The second point to notice is that even if we agree that Code's principle of continuity of matter provides a satisfactory principle of individuation for cospecific biological individuals, this does not establish that matter has the edge over form on this point. Both *sameness* of form and *sameness* of matter fail to individuate

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33 It may be felt that I have cheated in allowing the second statue to be of a different person and by a different sculptor. The objection would be that the relevant species term is not 'statue' but 'statue-of-Socrates-by-Praxiteles' (or whomever). In that case my example would fail to satisfy the requirement of cospecificity that is built into the principle we are considering. Although I have my doubts about the objection, I think that we can grant it and still make the case. Let us suppose the same artist to be depicting the same subject in the post-war statue, but suppose that the first statue portrayed Socrates as a leering lecher, while the second gives him the dreamy-eyed look of a noble visionary. This is surely not the same statue as the original, although it is materially continuous and cospecific (in the stricter way that the objection requires) with the original. We may even suppose the sculptor to have duplicated the style and appearance of the original exactly and still have reasonable doubts about identifying the post-war statue with the original.

In any event, it is important to note that the case of artifacts is not offered as an objection to Code's analysis of *continuing to be identical* in terms of *continuing to have the same matter*, for the post-war statue does not, when it comes into existence, *continue* to have the same matter that some other statue also continues to have. Rather, the counterexample's only force would be against the idea of formulating a general principle of identity and diversity for temporally disparate individuals in terms of continuity of matter. (I owe notice of this point to Mohan Matthen.)

34 We have left open the question whether sameness of matter is a sufficient condition of diachronic identity for cospecific biological substances. The question is probably best ignored, since the condition will seldom be satisfied, given the regularity of the metabolic interchange that obtains between a plant or animal and its environment.

diachronically, and Code has shown how *continuity* of matter (subject to certain limitations) can succeed. This obviously leaves open the possibility that one might use Aristotelian materials to construct a principle of *continuity of form* that would be at least as good a principle of diachronic individuation.[35]

There are, indeed, passages in which Aristotle seems to have some such notion in mind. Anscombe quite appropriately cites a passage in *Generation and Corruption*, I.5, where Aristotle, in discussing the phenomena of growth and nutrition, raises the question of what it is, in these cases, that grows. (Note that the thing that grows – the persisting subject of change – is just what a correct principle of diachronic individuation is supposed to pick out.) A man eats, and his leg increases in size; has the leg, but not the food, grown? Why haven't both grown, Aristotle wonders? After all, 'both that which is added and that to which the addition was made are greater' (μεῖζον γὰρ καὶ ὅ καὶ ᾧ, 321a32-3). His response is to point out that the thing which grows is that whose *substance* (οὐσία) remains: thus it is the leg, or the flesh, not the food, which has grown.

One might conclude that since what grows in this case is the flesh, it is still *matter* that is the persisting subject in terms of which questions of diachronic identity would be answered. But Aristotle points out that by 'flesh' we may mean form as well as matter (καὶ γὰρ ἡ ὕλη λέγεται καὶ τὸ εἶδος σὰρξ, 321b21-22), and that the growth in this case is with respect to form, but not with respect to matter. There follows this well known passage (321b24-28):

> We should think of it as if someone were measuring water with the same measure; for it's always something different that comes to be (ἀεὶ γὰρ ἄλλο καὶ ἄλλοτὸ γιγνόμενον). This is how the matter of flesh grows, but not by having every part added to; rather, soemthing flows in, something flows out, and every part of the figure and form is added to. [The translation is my own.]

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35 Although Furth does not actually formulate a principle of continuity of form, there are suggestions in his account (see esp. p. 642) that continuity of form is what he has in mind. For a more pessimistic assessment of Aristotle's treatment of diachronic identity, cf. Hartman, 84. Hartman sees Aristotle as needing the notion of continuity of form, but making no explicit provision for it.

New matter is taken in, in the form of food, and goes to make up flesh in the way that new water is taken into the measuring bucket. The persisting flesh does not depend for its continued identity on the matter that makes it up at a given time any more than the measure depends for its identity on the water that fills it up at a given time. What persists – flesh, the measure – is form, rather than matter.

This passage is suggestive, but not conclusive. What is missing is an indication that it is an *individual*, rather than a *kind* of thing, whose persistence Aristotle has in mind. He might hold that when the persisting subject is specified in terms of form, e.g., as a leg, or flesh, there is no guarantee that what persists is (numerically) the same leg, or flesh. So far as our passage is concerned, that guarantee might be provided only by the material continuity of the persisting leg.

In tracing the career of a persisting individual through time, we may, indeed, follow the form rather than the matter which (in Aristotle's vivid metaphor) flows through it. But to follow the form at all is to follow it *in* a persisting material individual, whose persistence as an individual may still be due to the spatio-temporal continuity of its component matter. It thus appears that a principle of diachronic identity satisfactory to Aristotle is not likely to omit reference to material continuity.

The last point may be put in a slightly different way if we consider how one might work out an adequate account of continuity of form (something I have not attempted to do). Although it is not at all clear what the details of such an account would look like, it seems certain that a definition of 'x is continuous in form with y' that is adequate to the task of making continuity of form the principle of diachronic individuation would have to be such that x's being the same-in-form with y does not entail that x is continuous-in-form with y, while the latter does entail that x is identical to y. And it is hard to see how the definition could do this without presupposing material continuity. For continuity of form over a given temporal interval would seem to be (something like) uninterrupted sameness of form, during that interval, *in* something that is materially continuous over that interval. Continuity of form is probably best thought of, then, as a requirement that is not independent of the requirement of continuity of matter.

The slogan that, for Aristotle, matter individuates is simplistic and only approximately correct. But I think that we have found that, from

both the synchronic and diachronic points of view, and although subject to certain qualifications, it still gives the right idea about Aristotle's thoughts on these topics.[36]

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36 I discussed an earlier draft of this paper with members of the philosophy department at the University of British Columbia; I have benefited, too, from the helpful comments of an anonymous referee for the *Canadian Journal of Philosophy*.