

**A PUZZLE CONCERNING MATTER AND FORM**

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Montgomery Furth has written<sup>1</sup>, "given a suitable pair of individuals ... there is no reason of Aristotelian metaphysics why the very fire and earth that this noon composes Callias and distinguishes him from Socrates could not, by a set of utterly curious chances, twenty years from now compose Socrates ...". He does not specify what these "curious chances" might be. But we may suppose that Socrates eats Callias for his lunch and that, owing to the superiority of Callias' flesh and bone, it is the matter of this which remains in Socrates after the period of twenty years.

That such an exchange of matter is possible is a point on which many Aristotelian scholars could agree. However, I wish to argue that such a case gives rise to a fundamental difficulty; for its possibility runs into conflict with certain basic metaphysical principles which are commonly attributed to him and which would also be commonly accepted.

The problem consequently arises as to how this difficulty is to be resolved. This problem itself may be regarded in two somewhat different lights. On the one hand, it may be regarded as a difficulty for Aristotle. The question then is whether one can find a solution which would be acceptable to him, either in the sense that he would or that he could accept it. On the other hand, it may be regarded as a difficulty for a neo-Aristotelian, i.e. to someone who is sympathetic to the analysis of things into matter and form. The question then is to find a solution, regardless of whether or not it would be acceptable to Aristotle.

For the most part, my concern has been with the exegetical question; and even here, my purposes have been somewhat limited. For I have not attempted to settle on one solution as opposed to another. My aim has been to map out the exegetical space rather than to locate the views of Aristotle within it.

However, it should be mentioned that I count myself a neo-Aristotelian (and, indeed, it was my own commitment to hylomorphism which led me investigate Aristotle's views in the first place). It has therefore been of some importance for me to take the purely metaphysical question into account.

The Puzzle. Our difficulty is simply stated. Suppose that Socrates has at one time the same matter as Callias has at another time. Then their matter is the same; their form is the same; and since each of them is a compound of matter and form, they themselves are the same.

It may help to state the puzzle in more formal terms. Let us use S for Socrates and C for Callias. Suppose that, in the envisaged situation, t and t' are the respective times at which Socrates and Callias are assumed to have the same matter. Let m be the matter of Socrates at time t and n the matter of Callias at time t'. Let F be the form of Socrates and G the form of Callias. Given some matter m and a form F, let Fm (sometimes also written as F(m)) be the compound of m and F. We then make the following assumptions:

- (1) S = C;
- (2) m = n;
- (3) F = G;
- (4) S = Fm and C = Gn.

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<sup>1</sup> I should like to dedicate this paper to the memory of Monty Furth, beloved colleague and friend. The passage cited here originally appeared in his [78], p.643, and is repeated in his book [88], pp. 180-81. I should like to thank the members of the 1989 conference on Aristotle in Oxford and of the 1989 conference on predication in Irvine for many helpful remarks on the topic of this paper. I am especially indebted to Gavin Lawrence for helpful discussions of the Greek text. The two puzzles which are considered here were originally raised, though without extensive discussion, in my unpublished paper Aristotle on Substance (pp. 27-8).

(1) says that Socrates and Callias are distinct, (2) that Socrates' matter (at t) is the same as Callias' matter (at t'), (3) that Socrates' form is the same as Callias' form, and (4) that Socrates is the compound of his matter (at t) and of his form and that, likewise, Callias is the compound of his matter (at t') and of his form.

All of these assumptions appear to be reasonable; and yet taken together they yield a contradiction. For from (2), (3) and (4), it follows by two applications of the Leibniz's Law (the substitutivity of identicals) that  $S = C$ , in contradiction to (1).

The above formulation of the argument has the advantage of brevity. But it has two annoying features. The first of these is that the assumptions concern a specific situation, the one in which Socrates eats Callias. This makes the argument needlessly specific, perhaps dangerously so; for we run the risk that the argument may not hold up under the given choice of a situation, even though it would have held up under some other choice. One might try to avoid this difficulty by making the argument suitably general: one supposes only that there is a possible situation in which the relevant assumptions hold. However, one then loses the ability separately to assess the premises upon which the argument depends, since the assumption of several specific possibilities has been replaced by that of a single general possibility.

The other defect in the formulation is that it presupposes the intelligibility of de re modal discourse. Thus it talks of the possibilities for Socrates and for Callias. The formulation also presupposes the legitimacy of the application of Leibniz's Law within modal contexts. Thus it is assumed, given that Socrates and Callias are the same in the given possible situation, that they are in fact the same. I myself would not question these presuppositions; but it is clearly preferable not to have to make them.

Fortunately, both of the undesirable aspects of the argument can be avoided under a longer, but more careful, formulation. This has three premisses which correspond to the premisses (2), (3) and (4) in the short form of the argument. Let us say that two things are cospecific if they are of the same lowest species. The first of the premisses then says:

Material Migration. It is possible for two cospecific things to exchange their matter, i.e. for the matter of one at one time to be the same as the matter of the other at another time.

The second premiss says:

Common Form. It is necessary that any two cospecific substances have the same form.

The third says:

Simple Composition. It is necessary that anything enmattered is the compound of what (at any time) is its form and its matter.

From these premisses a contradiction then follows in much the same way as before.

It should be clear that the present formulation removes the defects noted above: it provides an analysis of the assumptions on which the argument rests; and it avoids all appeal to de re modal locutions. Moreover, the present version of the argument is as dialectically cogent as the earlier version; any grounds for rejecting its premisses will be equally good grounds for rejecting the other's premisses. We will therefore adopt the long form as our official version of the argument, although we will usually revert to the short form for purposes of exposition.

Equivocation. There is an obvious challenge to the logic of the argument, which is that it equivocates on the meaning of 'matter'. Perhaps for us moderns there is no ambiguity in the notion of the matter of a thing. But for Aristotle, matter comes in "levels". Thus there is the level one, or proximate, matter of something; this itself may have proximate matter, which is then level two matter for the original thing; and so on.

Now the matter of which Socrates is a compound is his proximate matter, while the matter which migrates is presumably some low level matter, such as the elements, and certainly not his proximate matter. Indeed, his proximate matter is his body; and it is clearly not true, in the envisaged situation, that Socrates' and Callias' body are the same.

In response to this charge of equivocation, it should be pointed out that it is not evident that it is only the proximate matter of something which combines with the form to produce the corresponding compound. Suppose Socrates is the compound  $Fm$ , where  $m$  is his proximate matter (i.e. his body) and  $F$  the complementary form; and suppose  $m$  is the compound  $Gn$ , where  $n$  is the proximate matter of  $m$  and  $G$  the complementary form. Then it seems natural to suppose that Socrates is also the compound  $Hn$ , where  $H$  is some sort of composition  $FG$  of the forms  $F$  and  $G$ <sup>2</sup>. So it seems to be possible in principle that the matter of which Socrates is, in part, a compound should be the same as the matter which migrates

Unfortunately, such a possibility will not help defuse the objection. For let us grant that Socrates is the compound of some low level matter (such as fire and earth) and of some appropriate compositional form; and similarly for Callias. The componential matter will then be the same as the migratory matter. However, we will lack the same reason as before for supposing that the Socrates and Callias have the same compositional form. For the compositional form is more fine-grained than the predominant form (i.e. the form which is complementary to the proximate matter); and the cospecificity of Socrates and Callias, even under a universal conception of form, will be insufficient to guarantee that the compositional form is the same<sup>3</sup>. Admittedly, the ambiguity in the use of the term 'matter' will disappear; but it will have reappeared as an ambiguity in the use of the term 'form'.

There is, however, a more successful way in which the charge of equivocation may be resisted. We originally described our possible situation in such a way that it was meant to be evident that Socrates and Callias have the same (predominant) form. We must now redescribe it so that it is equally evident that the form of their bodies is the same, and so on all the way through the different levels of matter.

It is generally unclear when the matter of two things is of the same form, even when the things themselves are of the same form. It is unclear, for example, what are the necessary and sufficient conditions for two human bodies to be of the same form. All the same, there is a very general sufficient condition which may be given for two things to be of the same form. It is that they be qualitatively the same, i.e. that there be no qualitative differences between them, either of a relational or of a non-relational sort. For surely part (perhaps all) of what is implied by saying that the form is universal is that it can be specified in completely general terms, i.e. without

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<sup>2</sup> My unpublished paper contains an attempt to develop a theory of compositional forms. It should be noted that the compositional form of something can change if its matter changes. For suppose that  $F$  is the form of  $x$  and that  $m = Fn$  is the matter of  $x$  at one time and  $m' = F'n'$  the matter of  $x$  at another time. Then the corresponding compositional forms of  $x$  at those times are  $FG$  and  $F'G'$ .

<sup>3</sup> Under this way out, we must allow that two things are co-specific even though their proximate matter is not; the co-specificity of Socrates and Callias, for example, will not guarantee that their bodies are co-specific. For if Socrates and each level  $k$  matter  $M_k$  of Socrates were co-specific, respectively, with Callias and each level  $k$  matter  $N_k$  of Callias, then presumably the predominant form  $F_1$  and each level  $k$  form  $F_k$  of Socrates would be the same as the predominant form  $G_1$  and each level  $k$  form  $G_k$  of Callias. But then the compositional form  $F_1F_2...F_n$  of Socrates would be the same as the corresponding compositional form  $G_1G_2...G_n$  of Callias.

reference to any particular thing. (This might also be thought to follow from the requirement that form be definable).

Thus we may guarantee that the matters of Socrates and Callias are of the same form by supposing that they are qualitatively the same. Now, in general, the supposition of qualitative sameness will require that the universe be eternally cyclic (in both the backward and forward direction). Socrates and Callias will then be counterparts under two different cycles. However, such a drastic possibility is probably not required. For all that we need is that there be no relevant qualitative difference between Socrates and Callias, i.e. no qualitative difference which is relevant to them or their matter having different forms.

Of course, one might adopt a Leibnizian view on form: only exact qualitative counterparts have the same form. And one might combine this with a Leibnizian view on possibility; no two things can be exact qualitative counterparts. The possibility of Socrates and Callias having the same form would not then arise. However, Aristotle would not have adopted such an extreme position, either on qualitative form or on the existence of qualitative counterparts; and so he would not have had comparable reasons for rejecting the possibility.

Indeed, even if he were to reject a qualitative criterion for the sameness of form, it is still hard to believe, given that it is possible for Socrates and Callias to have the same form, that there would not be some possible situation in which their proximate matter also had the same form, the next-to-proximate matter had the same form (if it had any form at all), and so on all the way down to the penultimate matter. But assuming such a situation is possible, whether underwritten by a general qualitative similarity or not, the puzzle can be reinstated. For Socrates and Callias are distinct. So by the assumption, their (predominant) form is the same; and so, by Simple Composition, the only way they can be distinct is for their respective proximate matters  $m$  and  $n$  to be distinct. Again, by the assumption, either  $m$  and  $n$  both have no form or their form is the same. In the latter case, the only way for  $m$  and  $n$  to be distinct is for their proximate matter to be distinct. Proceeding in this way, we see that the matters of Socrates and of Callias must be distinct at every level. But also, given that the same matter cannot exist at different levels, the matters of Socrates and Callias across levels must be distinct. So no matter at any level of the one is identical to any matter at any level of the other; and migration is again ruled out<sup>4</sup>.

In this reformulation, it can be supposed that the componential matter is proximate matter, as long as Simple Composition is taken to have application, not only to sensible things, but to anything enmattered. Thus Simple Composition becomes the assumption that, necessarily, anything enmattered is the compound of its form and its proximate matter. On the other hand,

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<sup>4</sup> In a rigorous formulation of the argument we could substitute a notion of relevant similarity for the notion of co-specificity. The analogue of Common Form would then be: necessarily, relevantly similar things have a common predominant form (if either has any form at all). It must also be assumed that the proximate matter of relevantly similar things is also relevantly similar. It may be noted that it is not necessary to assume, as I have done, that the matter at different levels in Socrates and Callias is distinct. For let  $m_i$  be the matter at the  $i$ -th level of Socrates at the one time and  $n_i$  the matter at the  $i$ -th level of Callias at the other time. Suppose that for some  $k$  and  $l$ ,  $k < l$ ,  $m_k = n_l$ . Since  $m_k$  and  $n_k$  are relevantly similar and since  $n_k$  has something, viz.  $n_{k+1}$  as its matter,  $m_k$  also has something, viz.  $m_{k+1}$ , as its matter. But then  $m_{k+1}$  is the matter  $n_{l+1}$  of  $n_l$ ; and the argument may be repeated for  $m_{k+1}$  and  $n_{l+1}$ . Proceeding in this way, we see that there must be an infinite descending sequence  $m_1, m_2, \dots$  of matters of Socrates, contrary to the well-foundedness of the matter-of relation.

we may allow the migratory matter to be non-proximate. It is worth noting, however, that if some non-proximate matter migrates in the envisaged situation, then so does some proximate matter. For take the highest level at which the matter of Socrates migrates to Callias (perhaps this is the level below that of flesh and bone). Then at the next level up, we will have two distinct things between which there is the migration of proximate matter. So for the things at this level, something like our original formulation of the puzzle can be given, with the componential and the migratory matter both now being proximate matter.

Given the failure to fault the logic of the argument, let us turn to those solutions which challenge its premisses. There are three such solutions in all, one for each of three premisses. Let us consider each in turn.

Common Form. The common form assumption states that it is necessary that co-specific things have a common form or, under the more refined formulation, that it is necessary that relevantly similar things have a common form. This assumption might, of course, be denied on the grounds that forms are individual. For presumably, in that case, it would be impossible for two distinct things to have the same form (even it were possible for something different to have had the form in the first place).

It is not my intention here to enter into the debate concerning individual form. But I do want to make some remarks on the relevance of the debate to the resolution of the puzzle. It should be noted, in the first place, that it is a lot easier to attribute the belief in individual forms to Aristotle than to hold it oneself. For Aristotle seems to have a possible basis for the belief, viz. that individual forms are real and active principles in the world, which is denied to any right-minded modern. Thus in the absence of an alternative conception of individual form, the neo-Aristotelian must find some other solution to the puzzle.

In regard to the exegetical question, it should be observed that the issue of whether Aristotle believed in the mere existence of individual or universal forms is relatively uninteresting. For granted that he believed in universal forms, there would be no difficulty in supposing that he believed in individual forms as some sort of indexed version of the universal forms (something which we might represent as an ordered pair of a universal form and a thing which had that form); and given that he believed in individual forms, there would be no difficulty in supposing that he believed in universal forms as some sort of abstraction from individual forms (something which we might represent as an appropriate equivalence class of individual forms). The interesting question is the role of individual and universal forms in his thought and whether, in particular, one rather than the other is to be accepted as the "essence" of a sensible thing.

Similarly, what is relevant to the resolution of our puzzle is not the existence of universal or individual forms, but the status of the forms which enter into compounds. Can these be universal? Or must they be individual? The philosopher who would solve our puzzle by appeal to individual forms cannot be content with their existence. He must maintain that it is these forms, rather than their universal counterparts, which enter into a compound; and this can only be maintained, I assume, on the grounds that it is the individual, rather than the universal, forms which constitute the essence of things.

It is also important to distinguish between a partial and a full advocacy of individual forms. A full advocate will maintain that anything with a form has an individual form (which serves as its essence); a partial advocate will maintain that this is only true for some of the things with form, perhaps for all living things or for all things which need not themselves be the matter

of anything. The full advocate of individual forms has a general solution to the puzzle. But the partial advocate may not; for there may be applications of the puzzle to some of the things which he concedes are without individual form.

Two cases are of special interest. The first is that in which certain kinds of artifact are used in place of people. Thus it may be that one ship acquires the matter of another, much as in the Ship of Theseus puzzle<sup>5</sup>. The advocate of individual forms is then obliged to say that the ships have their own individual form or to find some other solution to the puzzle. Such a case may not be too serious, however, for someone who was unwilling to extend individual form to artifacts; for he could always dispute that the matter migrated to a distinct ship.

The other case is more serious in this regard. For as we have observed, if the low level non-proximate matter of a man can migrate, then the proximate matter of something like flesh must also be able to migrate; and hence the puzzle can be restated for flesh or whatever. In such a case the advocate of individual forms cannot dispute migration. So he must either dispute Simple Composition, which presumably would provide him with an alternative general solution to the problem, or he must concede that flesh and the like have individual form. Thus it seems that the doctrine of individual form cannot be confined to substance, i.e. to things which are capable of existing without being the matter of something; it must also be extended to matter, i.e. to things which are incapable of existing except as the matter of something.

We should note, finally, that even the full advocate may run into problems if he regards his advocacy of individual forms as a way of saving Simple Composition. For as we shall later see, there is another puzzle whose resolution would seem to require him to give up that assumption.

Migration. Let us consider whether the puzzle might be solved by rejecting Material Migration. It is clear that this is not an option for the neo-Aristotelian, for there seems to be nothing to prevent the molecules which now comprise me from later comprising you. But whether this is an option for Aristotle is not so clear, since it cannot be taken for granted that he would have adopted anything like our modern scientific conception of matter.

If form is taken to be universal, then Migration can be rendered as the claim that it is possible for something to be the matter of two distinct things with the same form; and this is the version we shall use. The negation of Migration, which we call Entrapment, then states that, necessarily, things with the same matter and form are the same.

It is important to distinguish Entrapment from two stronger claims. The first of these, which we may call Strong Entrapment, says that things with the same matter are the same. Thus Entrapment does not allow the matter of anything to be the matter of anything else with the same form, while Strong Entrapment prevents it being the matter of anything else, whether or not the form is the same. The second strengthening, which we may call (Material) Individuation, says that two things of the same form are the same in virtue of their matter being the same. Thus Individuation adds to Entrapment the requirement that the identity of the matter should be

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<sup>5</sup> It is worth pointing out that this version of our puzzle is not the same as the Ship of the Theseus puzzle, even though the two are based upon similar possibilities. For in the latter case, the puzzle concerns a conflict in our criteria for identity over time; whereas in our own case, the puzzle concerns a conflict between our intuitive judgements of distinctness, on the one hand, and certain principles from Aristotle's hylomorphic theory of substance, on the other. Thus the Ship of Theseus poses a problem for anyone; whereas our puzzle only poses a problem for the adherent of hylomorphism.

explanatory of the identity of the things<sup>6</sup>. There is some textual evidence which seems directly to support the view that Aristotle held to some form of Entrapment. The three main passages are from the Metaphysics, viz. Delta 6, 1016b, 31-32, Zeta 9, 1034a, 5-8, and Iota 3, 1054b, 15-16. Under an innocent reading, the first of these supports Strong Entrapment, the second supports Individuation, and the third supports Entrapment.

Some effort has gone into showing that the support for Individuation, or even some form of Entrapment, is illusory. I myself am inclined to favour the innocent readings. I am also inclined to think that Aristotle's remarks on the unificatory role of form in Z17 and H6 provide some indirect support for Entrapment<sup>7</sup>.

However, it is not clear to me, even under the innocent readings and with the indirect support, that the present solution remains open to Aristotle. This is partly because there is some further subtlety in how Entrapment is to be interpreted. If the puzzle is to be solved, then Entrapment must at least mean either that the proximate matter of anything enmattered is entrapped or that the proximate or non-proximate matter of any sensible thing is entrapped. But the above passages could be taken to support the restriction of Entrapment to the higher level matter of sensible things.

More significantly, there is the possibility that Aristotle is guilty of an inconsistency on this point. For (as I will later propose) he might believe in Entrapment because of his views on the nature of unification and he might believe in Migration because of his views on the nature of matter, without being aware of the inconsistency between the two. In any case, we need to consider the evidence on the other side, in favour of the possibility of migration.

It will be helpful to organize the consideration of this question around certain apparent instances of migration. We shall present three kinds of example (in order of increasing cogency); and in each case, we shall consider whether there are any textual or intuitively compelling reasons to suppose that Aristotle would have accepted the example.

But before so doing, let us make some general remarks on how the examples and the responses to them are to be characterized. Any apparent case of migration may be described in neutral terms, terms to which both the opponent and the proponent of Migration can agree. Thus they will agree that certain things continue as certain other things; and they will agree as to the

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<sup>6</sup>. There is also a principle of individuation corresponding to Strong Entrapment. Moreover, there are even stronger versions of Entrapment. Thus one might rule out the possibility that the matter of one thing could ever exist except as the matter of that thing; and one might also rule out the possibility that part of the matter of something could ever be part of the matter of something else or exist except as part of the matter of the thing.

<sup>7</sup>. Charlton's and Cohen's papers examine the evidence for individuation. The remarks on unification in Z17 and H6 will be discussed later in the paper; and Gill's book (p. 241) presents somewhat different considerations in favour of entrapment. No attempt will here be made to defend the innocent readings. But let us briefly consider the passage from Z9 in which Aristotle writes: "And when we have the whole such and such a form in this flesh and in these bones, this is Callias or Socrates; and they are different in virtue of their matter (for that is different), but the same in form; for their form is indivisible". Some commentators (for example, Furth in his book, p. 180, and Anscombe in her paper, p. 94) have interpreted this passage synchronically: what makes Socrates and Callias different is there being a single time at which their matter is different. But this is unsatisfactory. For the passage appears to be a response to the Platonic quandary: given that Socrates and Callias have the same form, then what makes them different? An adequate interpretation of the passage should therefore make it read as a reasonable attempt to answer the quandary. But interpreted synchronically, the passage cannot be read in this way, since it fails to state what would make Socrates and Callias different in the case in which there is no common time at which they exist. Under the innocent reading, however, the difficulty disappears; for what makes Socrates and Callias different is that the matter of Socrates at any time at which he exists is different from the matter of Callias at any time at which he exists. This is therefore a strong point in its favour.

form of these things. But they will differ on questions of identity. The proponent of Migration will hold that that the things, as described in the case, are distinct but that their matters, at the respective times, are the same. The opponent must hold either that the things are the same or the matters distinct.

For the proponent of Migration, the *prima facie* evidence for the claim of identity is the existence of a material continuity -- the matter of the one particular continues, in a suitable way, as the matter of the other; and the *prima facie* evidence for the claim of distinctness is the existence of a formal discontinuity -- the form of the one particular does not continue, in a suitable way, as the form of the other.

Thus the opponent of Migration must question the *prima facie* evidence for either the claim of identity or the claim of distinctness. In the one case, he must maintain that the underlying material continuity is not sufficient to convey the matter from the one particular to the other; somehow the matter gets trapped on the way (and we have what might be called an instance of entrapment). In the other case, he must maintain that the formal discontinuity is not sufficient to prevent the first particular's reappearance; somehow it gets reinstated (and we have what might be called an instance of reinstatement).

Let us now turn to the examples<sup>8</sup>. The first kind arises from the possibility of fission and fusion. Fission is constituted by the case in which one thing of a given form changes into several of that form, fusion by the case in which several things of a given form change into one thing of that form. Thus both are cases of intra-formal change; the "break" in the form consists, not in its being different, but in its not being a single thing which continues to have the form.

It seems reasonable to suppose that fission is possible just in case fusion is. However, combinations of the two seem to lead to instances of migration. For suppose an amoeba *xy* splits into the amoebas *x* and *y*, which then fuse back into the amoeba (*xy*). Then will not (*xy*) be a distinct particular with the same form and with the same matter, at some level, as *xy*?

The opponent of Migration could deny that fission and fusion are, in the required sense, possible. He need not dispute the apparent facts. He could concede, for example, that, in a neutral sense of the term, the one amoeba continues as two. But he could deny that the matter persists, i.e. that the matter of the two is the same as the matter of the one.

The appeal to entrapment in this case, though, is not very plausible (and as we shall later see, may not even help). What is more plausible is to deny that the final amoeba (*xy*) is different from the first *xy*. The matter, at some appropriate level, remains the same, but so does the amoeba; and hence we have a case of reinstatement<sup>9</sup>.

However, other apparent cases of migration which arise from the possibility of fission and fusion are not so readily disposed of. We are inclined to think that something can survive a fission or a fusion: that if an amoeba *Z* combines with a sufficiently small or insignificant amoeba then the resulting amoeba can still be *Z*; and that if a sufficiently small or insignificant amoeba splits off from an amoeba *Z*, then the remaining amoeba can still be *Z*.

But the opponent of Migration is unable to hold such a view. For much as in the Ship of Theseus case, an amoeba *Z* with matter *M* may split into a large and small amoeba, surviving as the large part; it may then fuse with a small amoeba, surviving as the fusion; and so on until the resulting amoeba *Z'* possesses none of the original matter *M*. In the meantime, the small

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<sup>8</sup> The framework within which these questions have been considered could be made much more systematic and precise; but this is not something that I will attempt here.

<sup>9</sup> It is interesting to note that in this case we have the migration of part of the matter to a distinct thing with the same form but not the migration of the whole of the matter.

amoebas that it has shed may fuse into an amoeba Z" whose matter is M. Our opponent is then required to make Z identical with Z', on account of its survival, and also to make Z identical with Z" on account of their common matter and form.

It therefore appears that anyone who would wish to solve the puzzle by denying Migration must maintain the following views concerning fission and fusion. First, the matter (at some level) survives these processes. Second, the things themselves do not survive, no matter how modest the change; all three things which are party to a fission or a fusion must be distinct. Third, anything which ceases to exist as the result of such a process can have its existence restored as a result of such processes. Thus the thing is not completely destroyed; for it is still capable of existing. And the processes are not completely destructive in their effect; for what they destroy they can also restore.

A similar kind of case arises with artifacts. Suppose that a house is wrecked or a statue melted down. Then can we not create a formally identical house or statue with the very same matter?

How one treats such a case depends very much on how one understands Aristotle's dismissive remarks concerning the substantial status of artifacts (e.g. in Metaphysics H2, 1043a, 4-5). Under an extreme interpretation, artifacts are only treated as things in their own right for the purposes of analogy. Strictly speaking, the statue is the same as the bronze, the house the same as its materials. The puzzle would not then arise, since the required contrast between the thing and its matter could not be drawn.

However, it is hard to see on such an interpretation how the bronze could be understood, even by way of analogy, to be the matter of the statue (which is, after all, identical to the bronze). A less extreme, and more plausible, view is that the statue and the bronze are distinct but that they only have the relation of matter to compound by way of analogy. Perhaps strictly speaking, the statue is an accidental unity of the bronze and its accidental shape, in much the same way that "musical Coriscus" is an accidental unity of Coriscus and musicality (cf. Metaphysics Delta, 1015b, 16-19). A related view is that the statue literally has the bronze as its matter and hence literally has something, such as shape, as its form. However, the form and the thing are not literally substantial, but only substantial by way of analogy<sup>10</sup>.

On either of these last two views, the puzzle will still arise, but with the analogues in place of the real notions. The same kind of responses can therefore be given. Thus one line is that the same matter does not persist through the processes of disintegration and reintegration. However, this is neither plausible, especially for the case of accidental unitites, and nor is it well supported by the text. (For example, in Metaphysics Delta 4, 1014b, 30-31, Aristotle writes, "for when a product [he has in mind something like a statue or utensil] is made out of these materials, the first matter is preserved throughout").

A more plausible line is that under suitable reintegration the original house or statue is reinstated (the form must then of course amount to more than just being a house or a statue). Thus the processes of disintegration and reintegration would be seen as analogous to the processes of fission and fusion. They might even be thought to be essentially the same kind of

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<sup>10</sup> To the extent that substance admits of degree, this interpretation is more plausible than the other; for it is easier to conceive of the substantiality of a form as being a matter of degree than anything corresponding to the relation of matter to form.

process, differing only with respect to whether the origin of the process has the same form as the result<sup>11</sup>.

We come now to the last and most cogent putative instance of migration. This is the case in which the apparent transfer of the matter is from one living thing to another and takes place by means of normal biological or chemical processes. For the purposes of the case, it is probably better not to use the example of people, as we did at the introduction. For the degree of relevant similarity which is required for the individuals to have the same form may also endow them with similar memories, similar personality, and so on. They will also enjoy whatever causal connection is required for the matter to apparently migrate. Can we be sure, in such circumstances, that the two individuals are genuinely distinct?

To avoid such problems, it is better to take the case to concern trees, let us say, rather than people. For I take it that the relevant similarities and causal connections would then provide no ground for supposing that the two individuals are the same. An oak that emerges in such a way from the decomposed remains of an existing oak will surely not be the same tree, similarities in structure, origin or whatever notwithstanding.

We may therefore suppose that Socrates and Callias are trees and that as we "track" the elemental matter of one at a given time, we find that it coincides with the elemental matter of the other at a later time. For migration genuinely to take place, the matter must "get out" of the one tree and it must "get in" to the other tree; the matter must also "get across" from the one tree to the other. It seems reasonable to suppose that if the matter can get out and in, then it can also get across, if only because the processes involved in its getting across are essentially no different from those involving in its getting out or in.

Now there are only two ways the matter could get out: either at the individual's cessation, and then of course the whole of the matter might get out; or before its cessation, in which case only part of the matter can get out. Likewise, there are only two ways the matter can get in: either at the individual's inception, and then of course the whole of the matter might get in; or after its inception, in which case only part of the matter can get in. Thus what is at issue is Aristotle's views on substantial change and on growth and diminution.

Aristotle's views on growth and diminution are hard to understand. But there is one comment of his which is specially relevant to our present concerns. In Generation and Corruption, I.5. 325-26, he writes, "This is how the matter of flesh grows: an addition is not made to each and every part, but some flows away and some comes in new". Now the natural way of understanding the phrase "some comes in new" is that some matter that is not a part of the matter of the flesh at one time is a part of the matter of the flesh at a later time. This then strongly suggests that migration could take place through the complementary processes of growth and diminution.

However, there are at least two ways in which this conclusion might be questioned. First, the phrase "some comes in new" might be interpreted to mean that some matter m that is not a part of the matter of the flesh becomes some matter n (not necessarily the same as m) which is a part of the matter of the flesh at the later time. The original matter m would not then literally enter into the flesh. Second, even if it were granted that the original matter later became part of the matter of the flesh, it still might be supposed that it was only in a time-dependent sense that it was part of the matter of the flesh. Thus even in the circumstances that were most propitious to migration, the most that could be concluded would be that the matter of the flesh of one

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<sup>11</sup> Note that in this kind of case the whole of the matter may migrate to something with a different form or even to something without any further form.

individual was comprised at one time of the same material parts as the matter of the flesh of the other individual at the later time. But the fact that the two fleshy matters were comprised of the same parts at the two respective times would not be a sufficient ground for concluding that they were the same. I do not think that either line of questioning is particularly plausible, but it does show that the cited evidence in favour of migration is not decisive.

Let us now turn to Aristotle's views on substantial change. According to the traditional interpretation of Aristotle on the topic, migration would then be possible; for the prime matter of the one tree would persist through all the changes and thereby become the prime matter of the other tree. In fact, nothing quite as strong as the traditional interpretation is necessary. For we do not require that prime matter persists, but only matter at some level; and we do not require that it persist through all changes but only those involved in the apparent case of migration. One might hold, for example, a variant of the traditional view according to which elemental matter persisted through non-elemental change, i.e. change which was not from one element to another. Migration could then be upheld under the reasonable assumption that the changes involved in some apparent case of migration might all be non-elemental<sup>12</sup>.

But the traditional line of interpretation has been questioned in recent times; and this might then seem to leave open the possibility of blocking the apparent cases of migration. I myself am disinclined to give up the traditional interpretation, especially in its relevantly weaker forms. But, all the same, let us see what follows in its absence.

Take something which is not elemental matter (nor prime matter should there be such). It may then be supposed that it contains elemental matter. For this thing, like any other enmattered thing, will submit to hylomorphic analysis: it will have a proximate matter (and a complementary form); the proximate matter will have its own proximate matter (and a corresponding form); and so on, all the way down to something which has no matter. But surely at the ultimate level of this analysis (if there is no prime matter) or at the penultimate level (if there is prime matter), we will reach elemental matter.

Consider now the first tree at the juncture at which it dies. Then the living tree at this juncture contains certain elemental matter; and so does the dead tree. The opponent of migration must then contend that this elemental matter is not the same<sup>13</sup>. For suppose it were. Then the death of the tree would be a case of a change in which the elemental matter stays the same. But if the death of the tree is such a case, then presumably the same could be true of the other changes involved in some apparent case of migration.

If the earth, let us say, of the living tree and the dead tree is not the same, then it seems to follow that their form is not the same<sup>14</sup>. For if their form were the same, then, given that the one matter continues as the other, it would be hard to see why they themselves would not be the same. Moreover, their difference in form can be no ordinary difference -- it cannot consist, for

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<sup>12</sup> In the Metaphysics H5, 1045a 3-6, Aristotle writes: "if from a corpse is produced an animal, the corpse first goes back to its matter, and only then becomes an animal." The matter here is presumably elemental matter; and there is no suggestion that elemental changes are required.

<sup>13</sup> There is a radical position according to which elemental and other low level matter is cross-temporally indeterminate (and in this sense is not a "this"). Under such a view, it would be incorrect to say either that the earth of the dead tree was the same as that of the living tree or that it was distinct. There would be earth in both trees; but whether it was the same earth would be a question which simply did not arise. Such a view might serve to somewhat soften the impact of my arguments; but I have not attempted to take it into account.

<sup>14</sup> If there is no matter underlying the elements, then they will have no form in the sense that is complementary to matter. But they will still have form in the looser sense of kind or species.

example, in the ratio of the contraries making up the earth; for there is no reason why the ratio would have to be altered by the change. Thus we have to distinguish two types of earth, one of which is "potential" by nature and the other of which is "actual".

What evidence is there that Aristotle would have been prepared to accept such a bifurcation in the form of the elements? He does hold a doctrine of "homonymy", according to which a dead hand, for example, is not the same, or of the same form, as a living hand. He is even prepared to extend the doctrine to the matter of the bodily parts, i.e. flesh and bone, and perhaps further. (See, for example, Z10, 1035b, 23-25). But there is no real indication that he would have been willing to extend it all the way down to the level of the elements; and it is odd, if he had countenanced the possibility of homonymy for the lower levels of matter, that this possibility was never made explicit<sup>15</sup>.

However, let us grant that the elemental matter of the living and the dead tree are not the same (and we may suppose that, if the elemental matter is not the same, then neither is the matter at any level). All the same, a difficulty remains. For even though the matter of the living tree does not actually exist when the tree dies, it may still potentially exist, i.e. be capable of reinstatement. But presumably the conditions for reinstatement are as favourable as they could be in the case of the second tree. So given that the matter is capable of reinstatement, it will actually be reinstated in the second tree<sup>16</sup>; and migration will again be secured (though the matter will only get out in the sense of having its potential existence preserved).

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<sup>15</sup>. The passage in Meteorology 12, 389b29-390b1 cannot very reasonably be used to support the extended homonymy claim. The point there is to show that certain things are what they are in virtue of a certain power of action or passion. This is revealed, for some things, by the fact that they lose their power when someone dies and thereby cease to exist; but there is no clear implication that all of the other things would also lose their power upon someone's death.

<sup>16</sup> A fuller and more precise version of the argument may be given. Suppose that none of the changes is destructive. Let  $x_0, x_1, \dots, x_n$  be the series of things involved in getting from Socrates to Callias (we suppose, for the sake of simplicity, that the changes do not involve one thing becoming many or many becoming one). So first  $x_0$  (= Socrates) becomes  $x_1$ , then  $x_1$  becomes  $x_2$ , and so on until  $x_{n-1}$  becomes  $x_n$  (= Callias). Let  $m_0, m_1, \dots, m_n$  be the respective elemental matter which is of (or is)  $m_0, m_1, \dots, m_n$ . We assume that none of the changes destroys the possibility of the original matter  $m_0$  existing. Thus  $m_1$  either is or is capable of becoming  $m_0$ ,  $m_2$  either is or is capable of becoming  $m_1$ , and so on up to  $m_n$  either being or being capable of becoming  $m_{n-1}$ . It presumably then follows that  $m_n$ , the matter of Callias, either is or is capable of becoming  $m_0$ , the matter of Socrates.

But the last possibility can be excluded. For suppose, for purposes of reductio, that the matter  $m_n$  is only potentially  $m_0$ . Then it is distinct from  $m_0$ . There are now two cases. The first is the more normal case in which none of the intervening matter  $m_1, \dots, m_{n-1}$  is identical to  $m_0$ . But then if  $m_n$  either is or capable of becoming  $m_0$ , it must be identical to  $m_0$ . For the conditions for the reinstatement of  $m_n$  are as favourable as they could be; for we have a "replica" of the situation in which the the matter last existed.

The less normal case is that in which some of the intervening matter  $m_1, \dots, m_{n-1}$  is identical to  $m_0$ . Consider a series of transitions  $x_n, x_{n+1}, \dots, x_{2n}$  which is exactly analogous to the series  $x_0, x_1, \dots, x_n$ , except in regard to beginning with  $x_n$  rather than  $x_0$ . Let  $m_n, m_{n+1}, \dots, m_{2n}$  be the corresponding series of matters (or "identicals"). If  $m_{n+i}, 0 < i \leq n$ , is identical to  $m_0$ , then  $m_i$  must also be identical to  $m_0$ . For if  $m_n$ , which is only potentially  $m_0$ , is capable of becoming  $m_0$

Let us say that something is destroyed if it ceases to exist, either potentially or actually; it is and can be no more. The opponent of migration must then hold that the matter of the tree is destroyed on its death. Indeed, what is typical of death in this regard is that it is change in which the individual is destroyed. Thus our opponent must hold quite generally that when something is destroyed then so is its matter at every level. He must extend the homonymy doctrine "out" as well as down; it must be maintained that no subsequent matter can be identical to the matter of something that is destroyed. This extension is reasonable for the bodily parts and the like; a living hand, after all, is different both from a dead hand and from any subsequently reconstituted living hand. But it is even more problematic than the original doctrine in application to the lower reaches of matter.

In conclusion, we see that there are various different grounds upon which Aristotle's commitment to Migration might be defended. There are the difficulties over fission and fusion; and there is the evidence from the traditional interpretation of substantial change. But even without a substratum for all change, it may be supposed that the elements are a substratum for non-elemental change; and even without a substratum for non-elemental change, it may be supposed that migration can be secured through reinstatement.

Given the implausibility of the case against migration for living things, one might think of combining the two solutions so far given. The puzzle would be solved for animate things on the grounds that their form is unique (and hence cannot be shared); it would be solved for inanimate things on the grounds that their matter is unique (and hence cannot migrate). Thus on this view there would be two fundamentally different kinds of substance (and two correspondingly different kinds of substantial form): those which are life-like and individuated by their form; and those which are matter-like and individuated, within their specific form, by their matter.

It has to be conceded that, once a differential stand on individual forms is granted, there is a great deal to be said in favour of a differential solution. But the case for a differential stand is somewhat mixed. On the one hand, the 'soul' is said, and plausibly taken, to be the individual form of a living thing; and there is nothing like the soul which is taken to play the same role in regard to a non-living thing. On the other hand, it is unclear what it is about the general nature of forms which would enable the forms of some things to be individual and the form of other things to be specific. Granted that the form of a living thing is its soul, there would have to be something in a non-living thing which was sufficiently unlike the soul to be specific (as opposed to individual) and still sufficiently like the soul to be a form. But it is unclear what such a thing would be.

Composition. I now wish to consider the question of whether the puzzle can be solved by rejecting Simple Composition. The standard interpretation of Aristotle (and one which I am myself inclined to hold) is that he is committed to both Common Form and Migration. The standard view (i.e. the content of the standard interpretation) is also one to which the neo-

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through a series of changes, then surely  $m_0$  itself is capable of becoming or staying as  $m_0$  through the corresponding series of transitions. Now let  $m_j$  be the last  $m_i$ ,  $0 < i < n$ , which is identical to  $m_0$ . Then no  $m_{n+i}$ ,  $0 < i \leq j$ , is identical to  $m_0$ : for otherwise,  $m_i$  is identical to  $m_0$ ; and so, by analogy between the series  $m_0, m_1, \dots, m_i$  and  $m_n, m_{n+1}, \dots, m_{n+i}$ ,  $m_{n+i} = m_n$  and hence  $m_n = m_0$ . Now in  $m_{n+j}$ , the conditions are as favourable as they could be for the reinstatement of  $m_j$ ; for we have a replica of the situation in which the matter last existed. So  $m_{n+j}$  is identical to  $m_0$  after all. A contradiction.

Aristotelian is likely to subscribe. The rejection of Simple Composition is therefore of special interest under this interpretation or view, since it constitutes the only way of rescuing Aristotle or the neo-Aristotelian from contradiction.

It is clear that Aristotle believes, in some sense, that any substance or anything enmattered is a compound of matter and form; for he repeatedly refers to such things as compounds of matter and form, and is often quite explicit in saying that they are such compounds. Let us call this unconstrued belief Composition. Then the question is how this belief it be construed.

The most straightforward construal is in terms of Simple Composition; for one most naturally takes the compound to be the simple compound of the matter and form at some given time, and one most naturally takes the relation between the two to be one of identity.

The naturalness of the construal is a strong presumption in its favour. However, there are two quite separate considerations that go against it. The first is that it makes the operation of compounding unduly selective and conflationary. For granted that the matter of something can be different at different times, one may wonder how the compound of the form with a single one of the matters is capable of yielding the given thing and one may wonder how the compound of the form with different matters is capable of yielding the same thing.

The other consideration is that, under the standard interpretation, Aristotle's adherence to Simple Composition would render his views inconsistent. However, the force of this consideration is somewhat problematic. For the fact that an interpretation renders a philosopher's views inconsistent or subject to some other kind of difficulty is not in itself a reason for rejecting the interpretation. It is a reason only to the extent that it is plausible to suppose that the philosopher himself recognized the difficulty. Now in the present case, it is not at all implausible to suppose that Aristotle was unaware of the difficulty. For many of Aristotle's commentators have failed to see the corresponding difficulty in their own interpretation of him; and it is not ungenerous, one hopes, to suppose that he himself had no greater logical acumen than his interpreters in this regard.

Nor is it difficult to see what might have led Aristotle or his interpreters to overlook the inconsistency. First, they overlooked the somewhat subtle argument that if the non-proximate matter of a substance can migrate then the proximate matter of something non-substantial can also migrate. Secondly, and perhaps more significantly, Aristotle had very few examples within his metaphysics of things whose proximate matter could migrate. Certainly, this would not be possible for living things or the higher forms of matter; and nor would it be possible for the lower forms of matter. Arguably, it would be possible at only one level within the hylomorphic hierarchy, viz. the lowest level at which homonymy still held. But Aristotle never seemed to be clear on what kind of matter lay at that level - whether it was flesh and bone, for example, or something else; and so he was never forced to confront a specific case of what he would recognize as the migration of proximate matter.

However, even if it is granted that Aristotle was inconsistent on this point, it is still important, under a more normative conception of the exegetical task, to ascertain what Aristotle might have said in response to the puzzle, i.e. to ascertain which solution, if any, does least violence to his views. So let us consider, both for this reason and for the ones stated earlier, the various other ways in which Composition might be construed.

One possibility is to relativize the relation of identity to a time. Something enmattered is then taken to be identical at a given time to the compound of its matter and form at that time. The puzzle would then be avoided by not requiring that the object be absolutely the same as the

compound with which it coincides. Thus on this view the enmattered things and the compounds would in general be distinct, though they would enjoy the peculiar feature that any object of one sort would always be found in the company of an object of the other sort. The compound would enjoy a kind of errant existence -- now being associated with this thing, now with that.

The main difficulty with this view is that there is no real evidence that Aristotle thought there were compounds in addition to the enmattered things with which they coincided. For example, in the battle for substantiality which is depicted in the central chapters of the Metaphysics, it is not as if the compounds were a contender in addition to the sensible things. It is clear that Aristotle regards the compounds and the sensible things as one and the same.

Another possibility is to derelativize the matter. One takes the matter of something to be its material realization or worm (an object which might be represented as a function which takes each time at which the thing exists into its matter at that time). This is a somewhat odd thing to understand by the matter of something. But it is not impossible; and there might even be contexts in which it is appropriate (as when we talk of the water in the river rising). A related proposal is to take the matter to be, not the matter as ordinarily understood, but the restriction of that matter to the time in question.

These proposals are again subject to an ontological difficulty. It is not that Aristotle would not want to admit material worms or temporal segments into his ontology; he might even agree that in some sense there were such objects. The point is that there is no indication that he would have treated such objects as the material components of compounds. The matter of something, in the sense of what "underlies" it, is matter as ordinarily understood. But the matter which enters into the compound is surely the same as the matter which underlies.

\_\_\_\_\_A second possibility is that Aristotle takes Composition to mean Simple Composition and yet does not take Simple Composition to be actually true but only something that would be true under the simplifying assumption of a static universe. However, it is odd that he never makes the assumption explicit or considers the question of what is actually true; and it is especially odd for someone so sensitive to the phenomenon of change.

A third possibility is that Aristotle takes Composition to mean Simple Composition and yet does not take Simple Composition to be actually true but only something that would be true under the simplifying assumption of a static universe. However, it is odd that he never makes the assumption explicit or considers the question of what is actually true; and it is especially odd for someone so sensitive to the phenomenon of change.

The fourth reading, which we may call Plural Composition, takes something to be the compound of its form and its various matters over time. Thus a thing  $x$  is taken to be identical to the compound  $F(m_1, m_2, \dots, m_k)$ , where  $F$  is the form of  $x$  and  $m_1, m_2, \dots, m_k$  are its proximate matters in order of temporal occurrence.

This proposal avoids the ontological excesses of the earlier ones; the ontology is the familiar one of substance, matter and form. It is also quite acceptable from a linguistic standpoint; for it is not unnatural to suppose that the reference to matter is plural reference. However, the proposal is still unable to rescue Aristotle from contradiction. For our puzzle reappears under the modest extension of Migration to include the possibility of Socrates and Callias having the same matter, not only at two a time, but over the whole period of their existence.

The last reading, which we may call Relative Composition, relativizes the notion of a compound to a time. Anything enmattered is identical, in an absolute sense, to a compound. But the compound is not, in an absolute sense, the compound of matter and form, but only relative to

a time. Thus the enmattered thing  $x$  is taken to be identical to the compound  $F_t(m)$ , where  $F$  is the form of  $x$  and  $m$  is the proximate matter of  $x$  at  $t$ ; or, under a combination of the plural and relative readings,  $x$  is identical to  $F_t(m_1, \dots, m_k)$ , where  $t$  is the period of time throughout which  $x$  exists and  $m_1, \dots, m_k$  are its proximate matters in order of appearance.

This proposal employs the familiar ontology; and again, it is not unnatural to suppose that in the reference to the compound there is an implicit reference to time. The proposal also saves Aristotle from contradiction. For even though Socrates and Callias have the same matter and form at the respective times, the compounds can be different on account of the times being different.

The first three readings can be ruled out on grounds of intrinsic implausibility. This leaves the reading in terms of Simple, Plural or Relative Composition. Of these, only the third avoids inconsistency (at least under the standard view) and only the second, or the second in combination with the third, avoids the problems of selectivity and conflation. Thus it might appear, from the evidence reviewed so far, that the preferable reading is in terms of a relativized version of Plural Composition.

However, the exegetical situation is complicated by the fact that, for Aristotle, the question of composition cannot be considered in isolation from his views on the unifying role of form. This role is described with great lucidity in chapters Z and H of the *Metaphysics*. In H6, 1045a, 7-10, he writes, "To return to the difficulty which has been stated with respect both to definitions and to numbers, what is the cause of their unity? In the case of all things which have several parts<sup>17</sup> and in which the totality is not, as it were, a mere heap, but the whole is something besides the parts, there is a cause". This cause, which he identifies with a form, is something which makes the parts into the unity; it makes bricks and stones, for example, into a house (1041a26) or animal and biped into man (1045a14).

Now there is an intimate connection between unification and composition. This may be roughly described by saying that the operation of composition must render unification possible; it is by jointly entering into the compound, in their own distinctive manner, that the form is able to make a unity of the matter.

It should be noted that this connection makes all the more intelligible our earlier animadversion against selectivity and conflation. It would be going too far to insist that all of the matter which is unified should be componential matter, i.e. the matter of any corresponding compound. In the expression 'cat', for example, it might be supposed that all of the subexpressions 'c', 'a', 't', 'ca', and 'at' are unified by means of the form of juxtaposition; and yet either of 'c', 'a' and 't' or 'c' and 'at' or 'ca' and 't' could be made the matter of a corresponding compound. But in such cases, it must be apparent how in compounding certain of the matter the rest gets unified; and since this is not apparent for things whose matter varies over time, it would seem to follow that all of their matter will enter into the compound.

Indeed, it is a general requirement on any satisfactory account of composition that it should make clear, or at least be compatible with, the unifying role of form. However, it is hard to see how Relative Composition, under either the simple or the plural version, is so compatible. The difficulty is to understand how the time by which the compound is indexed is relevant to the unificatory process. It cannot be that time is one of the elements that is unified; for the time at or

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<sup>17</sup>The requirement that the unity have several parts is probably stronger than Aristotle intends. For although the problem of unity is most evident when the thing has several parts, it still arises when the thing has only one part, as with the body being the sole (proximate) part of the man.

during which the matter exists is not in the requisite way a part of the resulting unity. Nor can it be that unification is relative to a time; for how can a time, as such, effect the manner whereby the form makes some given matter into one thing rather than another.

The only reasonable view seems to be that the process of unification is not many-one but many-many. The form does not generally make any given matter into a single thing; rather, it makes it into several. Thus the temporal index serves as a kind of external device by which one of the resulting plurality of unities is picked out.

However, it is hard to make sense of such a conception of unification. For how can the form make the matter into something that is ontologically one, i.e. a unity, without thereby making it into something that is numerically one. Certainly, the analogy of form with structure (which Aristotle so often uses) is of no help in this regard. Juxtaposition, for example, makes the letters 'c', 'a' and 't' into the single word 'cat'; and there appears to be no reasonable understanding of how it (or an allied operation) could make those letters into several such words.

There is also possibly some textual evidence that Aristotle would have wanted the form to make the matter into a single thing. For in Z17, 1041b6-8, he writes, "what we seek is the cause, i.e. the form, by reason of which the matter is some definite thing," (though, of course, here "definite" could indicate some definite kind of thing). Or again, in 1045a13-15, he asks, "what, then, is it that makes man one; why is he one and not many" (my emphasis). Moreover, the evidence in favour of Entrapment, in so far as it is accepted, can be taken as additional support (and vice versa).

It therefore appears, under the additional assumption that unification should be many-one, that the relativized versions of Composition are no better able than the unrelativized ones to avoid the charge of inconsistency. We might also note that, under this this assumption, the puzzle may be formulated without bringing in composition at all. For instead of concluding that the two compounds are the same, we may suppose that their common form must unify their common matter into the same thing.

We are therefore left, under the standard view, with no consistent interpretation of Aristotle (and with no consistent option for the neo-Aristotelian who accepts the unifying role of form). Moreover, the contradiction runs deep -- it depends only upon fundamental assumptions; and there is no obvious way, should we wish to render his thought consistent, by which it should be removed.

All the same, it might be thought, even when no attempt is made to remove the contradiction, that the plural reading of Composition is still to be preferred to the simple one; for it avoids the problems of selectivity and conflation; and it thereby coordinates better with what Aristotle took to be the unifying role of form. However, given our own previous diagnosis of the contradiction, this is not such a plausible line to take. For it may be surmised that Aristotle was led to overlook the possibility that the proximate matter of something could vary in much the same way that he was led to overlook the possibility that it could migrate. It could be conceded that he envisaged the possibility that the non-proximate matter of a living thing could vary. But it would be claimed that he never was never forced to confront any specific cases of variation in the proximate matter and that he overlooked the proof that variation in the non-proximate implies variation in the proximate matter. (The proof goes as follows: take the highest level at which the matter of something varies; then at the next level up, we will have a single thing whose proximate matter varies).

We are therefore left with no reason for preferring any of the other construals to Simple Composition. Perhaps what can be granted is that the presuppositions behind Composition and

Simple Composition are not the same. For the latter takes a thing to be the compound of its form and whatever is, at any time, its proximate matter, while the former takes the thing to be the compound of its proximate matter and form under the presupposition that the proximate matter is unique.

The Mereological Puzzle. Let us return to those solutions to our puzzle which require that we give up either Material Migration or Common Form. It might be thought that, with such a solution, there would be no need also to give up Simple Composition. But there is a secondary puzzle, related to our earlier considerations concerning selectivity, which provides independent reasons for rejecting this assumption.

\_\_\_\_\_ The new puzzle goes as follows. Surely Socrates' elemental matter  $m$  at one time might not be the same as his elemental matter  $n$  at another time. Let  $F$  and  $G$  be the respective forms of Socrates at those times which are complementary to  $m$  and  $n$ . Then by Simple Composition (stated with respect to matter at any level), Socrates is both the compound  $Fm$  and the compound  $Gn$ ; and hence the two compounds are the same. Now  $n$  is a part of  $Fn$ ; and since  $Fn$  and  $Gm$  are the same,  $n$  is also a part of  $Fm$ . But  $n$  and  $F$  have no part in common; and so, for  $n$  to be a part of  $Fm$ , it must be a part of  $m$ . By symmetric reasoning,  $m$  is a part of  $n$ . So  $m$  and  $n$  are parts of one another and hence are the same. A contradiction<sup>18</sup>.

The two puzzles are rather different. The first depends upon the possibility of migration, of the same matter being in two things; the second depends upon the possibility of variation, of different matter being in the same thing. Both puzzles make use of the assumption that anything enmattered is identical to a compound of what, at any time, is its matter and form. But the first argument only exploits the functional aspect of compounding, viz. the fact that for any matter and form there is at most one compound with that matter and form. The second argument also exploits a mereological aspect of compounding, viz. the fact that the mereological content of the compound is exhausted by its matter and form. Given their respective assumptions, the two arguments then move in opposite directions: under the first, two compounds which should be

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<sup>18</sup> Various points about the argument should be noted. (1) The term 'part' is used in a broad sense to include the case in which something is a part of itself. The assumption that mutual parts are the same can be avoided if it is supposed, at the outset, that one of the two matters,  $m$  and  $n$ , is not a part of the other. The argument then establishes that it is a part. (2) It could be supposed that the compound was of the form  $F_1(F_2(\dots(F_k(m)\dots))$  rather than of the form  $(F_1F_2\dots F_k)(m)$ . The commitment to compositional forms would thereby be avoided and Simple Composition could be limited in its application to proximate matter. (3) The matter  $m$  and  $n$  has been taken to be elemental (or penultimate) in order to make it more plausible that it could vary. Variation requires that the matters  $m$  and  $n$  be distinct and would therefore be excluded under a position which took the question of their identity to be without sense. (4) It is important to the argument that  $m$  and  $n$  be at the same hylomorphic level; for it is this which prevents  $n$  having any part in common with the form  $F$ . Suppose, for example, that  $F$  were the composite form  $GH$ . Then the matter  $n = Hm$  would be a part of  $(GH)m = G(Hm)$ , yet not a part of  $m$ . From this example we see that it would be incorrect to suppose that any material part of  $Fm$  is a part of  $m$ . Rather, any material part of  $Fm$  is either a part of  $m$  or is a compound of  $m$  and a part of  $F$ . We also see that the claim that forms are parts is theoretically significant; for without it the proper formulation of the principles governing the mereological behaviour of compounds could not be given. Thus Aristotle's view that the form is part of the compound should not be dismissed as a fanciful extension of the idea that the matter is a part.

distinct are shown to be the same; under the second, two compounds which should be the same are shown to be distinct.

Despite their differences, the two puzzles can be seen to have a common source in the question of unity. A form is meant to make the parts of something, either some or all of them, into that thing. Two necessary conditions for a form to unify may be distinguished. The first is that the form make the parts into a definite thing, i.e. into one thing rather than two. The second is that the form make the parts into the requisite whole, i.e. something which has as its parts the parts of the given thing. We may now think of the first puzzle as a proof that the first condition cannot be satisfied and the second puzzle as a proof that the second condition cannot be satisfied.

How is the new puzzle to be solved, on behalf of Aristotle or the neo-Aristotelian? And to what extent can the solutions to the two puzzles be combined? One possible solution to the second puzzle, which is compatible with any solution to the first, is to reject the assumption that matter and form are mereologically exhaustive of the compound. There are, in fact, two assumptions here. One is that the matter and form are parts of the compound, the other is that any material part of the compound  $Fm$  must either have a part in common with  $F$  or be a part of  $m$ . Now the adherence to a hylomorphic view does not require that the matter or the form be parts of the thing which has that matter and form. However, it is clear that Aristotle's hylomorphism is not of this mereologically neutral sort.

In regard to the first assumption, he repeatedly says that the matter is part of the compound. There is also some indication that he believed that the form is part of the compound (and even without this assumption a version of the argument could still be given). For example, the most natural reading of the passage at 1023b18-22 of the Metaphysics suggests that the form, as given by the "angle", is a part of the bronze cube. Admittedly Aristotle does not take compounds to be wholes in the same way as heaps; and he does not take the matter and the form of the compound to be parts in the same sort of way (thus he writes in Metaphysics H3, 1043b5, "the syllable does not consist of the letters+juxtaposition, nor is the house bricks+juxtaposition"). But these disanalogies serve, not to undermine the mereological claims, but to guard against their being misunderstood.

\_\_\_\_\_ In regard to the second assumption, it is clear that Aristotle must take the matter and form to be wholly constitutive of the compound. For what else could make a distinctive contribution? Of course, this is not to deny that there are any other parts; the "heap"  $a+b+c$  is constituted by  $a$  and  $b+c$ , and yet has  $b$ ,  $c$ ,  $a+b$  and  $a+c$  as other parts. However, it does mean that something can be another part only in virtue of an appropriate mereological relationship to the constitutive parts. But given that this is so, it is hard to see, in the present case, how some matter which is not a part of  $m$  and has no part in common with  $F$  could be a part of  $Fm$ . For what could the relevant mereological relationship to  $F$  and  $m$  be?

Another solution is to deny the assumption that it is possible for the matter (at any given level) of a thing to be different at different times. The denial of this assumption, viz. that the matter of a thing must stay the same, may be called Rigidity. Since Rigidity is often confused with some form of Entrapment, it will be helpful to consider, if only briefly, the connection between the two.

The one assumption is essentially a converse to the other. For Entrapment tells us that the thing is the same when the matter is the same, while Rigidity tells us that the matter is the same when the thing is the same. Or to be more precise, given the condition that  $m$  is the matter of  $x$  at one time and  $n$  the matter of  $y$  at another time, Entrapment then tells us that  $x = y$  if  $m = n$ , while Rigidity tells us that  $m = n$  if  $x = y$ .

Even though Entrapment and Rigidity are logically independent, there is a plausible implication from migration to variation. For suppose that my elemental matter, let us say, can migrate. Then it can be the matter of a different person. But there would appear to be no reason in principle why I should not exist at the same time as the other person has that matter; and so my elemental matter at that other time will then be different from what it was.

However, it seems to me that the implication in the other direction is not so plausible<sup>19</sup>. For even though my elemental matter changes over time, this is not necessarily because some elemental matter has "got in" or "got out"; since what one takes to be the entry or exit of the matter may in fact involve a change in its identity.

\_\_\_\_\_ It seems reasonable to suppose that the neo-Aristotelian would be committed to Variation and that therefore the present solution would not be open to him. There is also some evidence that Aristotle is committed to Variation (and, as far as I know, no evidence that he is committed to Rigidity). Perhaps the closest direct evidence is contained in the passage from Generation and Corruption (321b, 25) which has already been cited in support of migration<sup>20</sup>. He there writes of new matter becoming part of the matter of the flesh. But again, the evidence is not decisive. For let us grant that m is a part of the matter x of the flesh at one time and that it is not a part of the matter y of the flesh at another time. Then it would follow that x was not identical to y if it were in an time-independent sense of part that m was a part of x and not a part of y. But it may be or fail to be a part in a time-dependent sense; and, in that case, the non-identity of x and y could not be inferred. Nor can it be argued, should x and y be the same, that their matter will change on the grounds that their parts change. For the sense in which m is a part of x is presumably one which puts it at the same hylomorphic level as x and so is not relevant to the identity of its matter.

Apart from the direct evidence, there is some indirect evidence that Aristotle is committed to Variation. As I have mentioned, there is a plausible implication from migration to variation; and so the evidence for the one will, to that extent, carry over to the other. In the case of the evidence from homonymy, we may argue more directly. For suppose we ask on what reasonable basis it could be maintained that my elemental matter remains the same over time? The only plausible view seems to be that the matter, in such cases, is not something which we take to vary according to the biological circumstances but something whose essence is to be the matter of the thing in question. Thus my elemental matter will be whatever fulfils a certain role at a sufficiently low level of my makeup; and that matter will grow and diminish, staying the same throughout, as I grow and diminish. On such a view, Aristotle would have been willing to countenance the extension of the doctrine of homonymy to the lower levels of matter; and so the fact that he was not so willing indicates that this was not his view and that variation was for him a real possibility.

But although the textual evidence seems to point in the direction of Variation, it should be remarked that Rigidity is a perfectly coherent doctrine and that it has the possible advantage over Variation of not requiring what might seem to be an arbitrary distinction between the matter which conforms to homonymy and that which fails to conform. Given the natural affinity of Entrapment to Rigidity, we therefore have a single doctrine about the nature of matter which is capable of providing a simultaneous solution to both puzzles.

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<sup>19</sup>And hence the argument in Furth's book (p.180, lines 15-21) from variation to migration can be resisted.

<sup>20</sup> The passage has been used in support of Variation by Anscombe (p. 83 of her paper) and by Hartman (p. 59-60 of his book).

There remains, finally, the question of whether Simple Composition should be rejected. If it were only a question of solving the present puzzle, then it is clear that Simple Composition should be dropped in favour of Plural Composition, since the formerly recalcitrant parts would thereby be incorporated into the compound. But the original puzzle also needs to be taken into account.

Under the standard interpretation of Aristotle, we were led to believe that Composition should be construed as Simple Composition; and consideration of the present puzzle does not seriously undermine this view, for the reasons already given. However, under a non-standard interpretation, it would be plausible to suppose, in the light of the present puzzle, that Composition should be construed as Plural Composition; and this position could then be combined with either Individual Form or Entrapment.

Still, it should not be thought, in either case, that the difficulties over understanding unification are thereby removed. To illustrate these difficulties, let us again use the analogy of form with structure. Then under the adoption of Individual Form, it would be as if the structure which moulded the letters 'c', 'a' and 't' into the word 'cat' were unique to the resulting word; and under the adoption of Entrapment, it would be as if letters from which the word 'cat' was constructed were unique to the resulting word. Such a conception of unity is hard to understand; for it seems as if part of what is meant to explain the unity, be it the principle or the elements, is itself understood in terms of the unity.

If I am right, the general exegetical situation is rather odd. For the logical relations among the assumptions of the temporal puzzle are such that if either Material Migration or Common Form is denied, then Simple Composition can be retained; and they are also such that if Material Migration and Common Form are retained, then Simple Composition must be denied. But the exegetical relations appear to be the reverse of these. If it is supposed that Aristotle rejected either Material Migration or Common Form, then it is plausible to suppose, given the mereological puzzle, that he also rejected Simple Composition. On the other hand, if it is supposed that he accepted Material Migration and Common Form, then it is plausible to suppose, in the absence of any reasonable consistent alternative, that he also accepted Simple Composition.

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