ALEXANDER OF APHRODISIAS
ON MIXTURE AND GROWTH

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Ancient discussions of mixture and growth have to do with a broad range of philosophical issues, such as the nature of life, the boundary between living and not living, and the physical mechanisms operating in animate structures. Approaches to the solutions of these problems developed in antiquity seem to be earning more and more appreciation in the context of today's metaphysical discussions. Following the revival of interest in Aristotle's psychology welcomed by modern philosophers of mind as an alternative to both the excesses of Cartesian dualism and the deficiencies of numerous reductionist theories, there has been a new rise of interest in Aristotle's theory of natural substance, in its full rigging, including such dusty items as the concept of mixture, which has been recently rediscovered by philosophers as a promising model for an ontological description of the type of unity present in a multi-layered, hierarchical composite structure.¹

The discussion of mixture and growth by Alexander of Aphro-

disians presents special interest in this respect, as it uses both topics in order to articulate the key concepts of Aristotelian metaphysics of hylomorphism, such as form and matter of individual substance, identity, and continuity through change.

The goal of this paper is to study these concepts as presented by Alexander in his polemic against the Stoic theory of mixture and in his elaboration of Aristotle’s analysis of growth. The first part of the paper has to do with mixture. I show that Alexander’s criticism of the Stoic theory of total pervasion is based on his idea that ingredient qualities cannot be individuated in a mixture because in a mixed state they lose their specific identities, on which their spatio-temporal continuity depends. The second part is devoted to Alexander’s account of growth, which elaborates on the Aristotelian thesis of persistence of form by spelling out some ontological constraints on the concept of ‘flowing matter’ in the account of material continuants. Both discussions have a bearing on the concept of individual substance construed in terms of Aristotelian hylomorphic theory, and show differences between treatments of the individual in the Stoic and Aristotelian systems.

1. Alexander against the Stoic theory of mixture: De mixtione

Alexander rightly considers the theory of mixture to be at the root of the most important doctrines of Stoic physics. Many Stoic claims which sound paradoxical to an un schooled ear receive their technical explanations in this theory, and any criticism which does not want to remain superficial has to deal with those explanations. This theory spells out, in particular, the manner of presence of the cosmic active principle in the inert matter of the cosmos: the cosmos itself and all its parts have their unity and cohesion due to the mechanism of ‘total blending’ which is described in the Stoic classification of mixture. This classification includes juxtaposition (κατάθεσις), where the ingredients are not changed, and the whole is an aggregate; fusion (ἀνάθεσις), where the ingredients are mutually destroyed and an altogether new quality of the whole is formed;

2 Alexander regards his own project in the De mixtione as being well above the elementary level. De mixt. 3. 216. 1–4 Bruno: μετέθεσις δέ τινας φύσεως ἐπὶ τὴν ὑπὸ ἑξείρισεις καὶ μιᾶς ὑπὸ τοῦ χαράκτηρος καὶ τῆς ἀρχής ἱκανησίας, ὅν καὶ αὐτῶν παρακαταλαβόμενος τὸ ἕκπληκτον τος καὶ προηγοῦμενον εἰρήματά σας μείλεται τοις λόγοις ἐξετάζων ἡμετέρως πραξικοπήματι.

and blending (κράσος), a very special case where the ingredients fuse their volumes while preserving intact all their qualities. Two key assumptions made by the Stoics about the process of blending will be disputed by Alexander: the complete coextension of the ingredient volumes (ἀντικροσθεὶσις), and the complete persistence of all the qualities of the ingredients in the blend. In respect of the latter assumption, Alexander develops two arguments: against the co-persistence of qualities within what the Stoics call ‘blending’; and against the recovery of numerically identical qualities upon the dissolution of a blending.

1.1. Coextension

The mutual coextension of some two or even more bodies in their entirety with one another so that each of them preserves its own substance and its quality in such a mixture—this, he [Chrysippus] says, alone of the mixtures is blending; for it is a peculiarity of bodies that have been blended that they can be separated again from one another, and this only occurs through the blended bodies preserving their own natures in the mixture. (De mixt. 3. 216. 28–31.

2 The physical mechanism of this process falls under the causal pattern that involves ‘co-operant causes’. Alexander cites several Stoic examples of such causation where a physical action is made possible by the interaction of two or more causes.


The mechanism of blending is illustrated by many examples of the mutual inseparability of conceptually distinct corporeal agents:

They employ as clear evidence that this is the case the fact that the soul, which has its own substance [δυνατάν ἐν ζωών ἁπάντων], just like the body that receives it, pervades the whole of the body while preserving its own substance [τὸν ἄλλον ἄλλως] (for there is nothing in the body possessing the soul that does not partake of the soul); and the same holds for the Nature of plants, as also for the State in bodies held together by their State. Also, they say that fire passes completely through iron with each of them preserving its own substance. And they say that two of the four elements, fire and air, being of fine structure, light and having tension [ἀποσωμάτος τε καὶ νόοια καὶ σώματα ἀπήκ], completely pervade earth and water, which are dense and heavy and lack tension; and that each pair preserves its own nature and continuity. They think that drugs that are deleterious, and all such odours, are blended with the bodies affected by them in a total juxtaposition. Chrysippus also thinks that light is mixed with air. (De mixt. 217. 32-218. 9 Bruns, trans. Todd, lightly modified)

In his refutation, Alexander exposes inconsistencies and physical impossibilities involved in the concept of coextension, exploiting the ambiguities of formulation in the reports of the doctrine: ‘total pervasion’ as described by the Stoics is in conflict with the geometrical notion of addition; it may entail the existence of void within the world (something the Stoics officially deny); the smaller of the two bodies, which is said to remain the same and yet occupy a greater place, turns out not equal to itself; nor is the greater one, which receives a smaller one in itself without undergoing an increase. He uses the tactics standard in contemporary anti-Stoic polemic, criticizing Stoic doctrines in versions often already suitably adapted for such criticism.

Yet Alexander differs from the main run of the critics in that in his argument this tactic is normally subordinate to a strategic goal set.

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or facilitated by collective action of the parts of an aggregate: incense preserving its smell when thinly spread over a large volume of air; gold easily melted in the presence of some catalysts; human cooperation achieving results which it would have been impossible to achieve for the same individuals acting solo. The idea is that the interaction produces a special type of cohesive power between the parts of the interacting substances which does not destroy the internal cohesion of each of them, but activates the inert parts of substances and raises their elasticity to such an extent that they are able to coexist in the same volume.

Since this is the case, they say that there is nothing remarkable in the fact that certain bodies when helped by one another are in this way united together in their entirety so that being preserved along with their own qualities they have a complete mutual coextension through one another, even if some of them are rather small in bulk and in themselves unable to spread to such an extent, while at the same time preserving their own qualities. For in this way also the cup of wine is mixed with a large amount of water and helped by it to such a great extension. (De mixt. 4. 217. 26-32 Bruns, trans. Todd, lightly modified)

The example of a cupful of wine goes back to Aristotle, who uses it to illustrate his theory of mixture: a cupful of wine adds its volume to the sea, but its quality of wine is destroyed and turned into water. According to the Stoics, a cupful preserves its vinous quality, but it is now evenly extended over an overwhelming bulk of the sea. So although it is still present intact within this bulk, the intensity of its presence in any given part of the total volume which can be measured by the ratio ‘cupful : sea’, is arguably small enough to escape perception.  

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3 In the example of the cupful of wine, the Stoic thesis is perhaps deliberately presented in a paradoxical form. Its substance is much less provocative, being in line with traditional cosmology that assigns a crucial role in physical change to processes of expansion and contraction, condensation and evaporation. (For discussion, see D. E. Haith, ‘The Stoic Theory of Change’, Southern Journal of Philosophy, 23, suppl. 1985), 39-56; cf. id., The Origins of Stoic Cosmology [Origins] (Columbus, Oh., 1977), 57-60). Alexander’s school treatise Moutisa 14 (‘That it is impossible for a body to go through body’) contains some evidence that the idea of different intensity of blended qualities was possibly present in the Stoic original argument for coextension, when the author dismisses this as a possible defence of the Stoic position: τὸ γὰρ λέγετον, ὅτι τῇ διάσωσις ὁδὸς ἑστὶν [ἐκ τῆς ἀνατομίας τῆς κοιλάτης], οὔτε ἓργον τῆς κόλαβος ἀρχήν γὰρ εἰς τὴν τὰς προγεγομένας διενεργεῖ τὸν ἄλλο τὸ ποιητικὸν ἀνάμειν ἀνὰ ἀκολούθεσαν (Mout. 14, 140, 23-5 Bruns).

4 De mixt. 6, 210. 9-21 Bruns; cf. Alex. Mout. 14, 140, 10-15; 141, 9-22 Bruns.  

5 De mixt. 6, 210. 22-7 Bruns; cf. Alex. Mout. 14, 141, 4-8 Bruns.  

6 De mixt. 6, 210. 28-320, 2 Bruns; cf. Alex. Mout. 14, 140, 20-3 Bruns.

7 Cf. [Galen], De qualitatis incorporis 109-118 Giusti (assuming the actual infinity of parts on the basis of infinite divisibility); 134-54 (multiple occupancy of one place—geometrical paradoxes); 162-85 (reconstructed cosmological scheme).
body in the process of contracting;” 19 and in the meaning (iii) ‘to be replaced’, denoting the character of internal displacements in ‘hard’ (σκληρά) substances as opposed to soft ones, where internal displacement is accompanied with ‘yielding inwards’. 20 Alexander’s concept of ἀντιπεριτόνα εἰσι ἀλλήλους as mutual replacement, which he develops in his polemic against the Stoic theory of διάστασεως, incorporates some aspects of all three Aristotelian meanings. 21 According to Alexander’s account, in the course of such replacement, ingredients first become juxtaposed in a particular structure, which makes it easy for the differently qualified parts of the volume to interact, and then the moist, inherent in them, makes the structure continuous. 22

The disagreement between the two systems, although stated in narrow terms of physical theory, bears strongly on some cardinal

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19 See H. D. P. Lee’s note to Meteor. 1. 12, 349a2 in the Loeb edition; Solmsen, Aristotelis System, 142–15.
22 De init. 14, 1. 1–4 Bruus: ἐὰν δὲ γὰρ κατὰ άληθῆ διὰ τήν ἄρχουσαν κατὰ τὴν πρώτην κινηματικὴν σώματα προσέλθῃ καὶ τὸ ἀναπτύσσεται ήχον ἵππον πρὸς ἄλλα, γίνεται αὐτὸς κατὰ τὸ ποσότητα τα καὶ διάμετρα ἄλλη, ἐπεὶ τὰ ἄλλα κρίνει. It has to be noted that the fact that Alexander here mentions ἄρχουσα does not mean, as Joachim thought, that the state of ἀρχουσα is restricted to liquids only (H. H. Joachim, ‘Aristotle’s Conception of Chemical Combination’, Journal of Philosophy, 25 (1929), 520–8 at 522). Alexander’s theory is essentially that of a body ‘in us’, and ἀρχουσα (the cohesion of substances) is mixtures of bodies as a part of their elemental ingredients. This is the meaning of his remark καὶ γὰρ ἐὰν τὸν θρόικον γίνεσθαι διαφορὰ καὶ γίνεται ἄρχουσα, ἐπειδὴ γὰρ τὸ ἀριστοκρατεῖ καὶ γινομένης ὑπονομῇ εὐσφαιρέσθη, ἔννεπτος μὲ ἀρχουσα.
23 Joachim’s point, however, is valuable in that it draws attention to the problem of relations between Alexanderian and Stoic doctrine. The distinction between ἀρχουσα and μεταμφιστανας spotted by Joachim in Alexander is actually attributed to Chrysippus in Stob. et al. 1. 17. 4. 153, 24–154. 14 Wachsmuth (=SVF ii. 471, 153, 6–18 von Asnins), where μεταμφιστανας (the coexistence of dry substances) is exemplified by heated iron, salt, and water in a body ‘in us’, and ἀρχουσα (the cohesion of liquids) by mixtures of ‘wine, honey, water, vinegar, and similar’. Alexander’s explanation of mixture is, in my view, in good agreement with Aristotelian physics. However, the anomaly sensed in the exposition by Joachim (who does not cite the Stoic s passage) probably has to do with Alexander’s tendency to set out the explanation in conformity with the terms of both Stoic and Peripatetic physical doctrines. What is common in this case is the lack of explanation, not the explanation itself.

A further parallel between Alexander and the doxographical tradition has to do with the presentation of the difference between the Stoics and the Peripatetics on the problem of mixture (cf. Galen, Methodo med. i. 2, 3, 15 Kühn-SVF ii. 411).
metaphysical issues. The point of Alexander’s theory of ‘mutual replacement’ is to rule out the idea that propagation of physical qualities involves corporeal agents other than the sensible substances in which these qualities reside. According to Alexander, qualities and states have no separate existence outside the material individuals in which they inhere. Therefore a composite quality arising in a mixture as a result of the coming together of several qualified individuals cannot be regarded as an immediate product of ingredient qualities, as the Stoic picture suggests, so that both the old ingredient qualities and the new resultant quality would now be present in a mixture. Rather, when a new (composite) quality comes to be, the old qualities must in some sense cease to exist.

The Stoic picture of blending distorts the relation of inherence not so much because of paradoxical claims about coextension (although Alexander makes full use of that too in his polemic), but more importantly because it allows a quality which is numerically the same to inhere in several different bodies (when it is in a ‘free’ and ‘bound’ state, respectively). The cause of this distortion, according to Alexander, is that the Stoic theory of blending steps over its proper limits:

How can the common preconception about blending be maintained if it is claimed that even the State itself is mixed with the things that have it, and that their Nature is mixed with plants, light with air, and the soul with the body, if it is precisely the preconception about the things that are blended that they are capable of existing individually before the blend? For this reason, at any rate, they themselves say that bodies that have been blended can be separated again, and that they can thereby distinguish blending from fusion and destruction. But no State is separable from what has it so as to be capable of independent existence, nor could the nature of plants exist apart from them. How could one conceive of light as separable from transparent bodies? Neither could soul be like this, as they think, since the unmatted form cannot be without matter and body. (De mixt. 9, 222, 26–33 Brun, trans. Todd)

Because the idea that pneuma in its states (State, Nature, and Soul) is mixed with the bodies of individual substances is unacceptable, evidence from the theory of blending adduced by the Stoics in its support must be revised. Alexander discusses in detail two of the Stoic ‘inductive’ arguments for the persistence of qualities, based on such facts as they believe can validate the concept of blending as ‘total pervasion’. The first argument involves the example of ‘heated iron’, a standard Stoic illustration of a co-presence of two different qualities (of iron and fire) in a blending, in the course of which none of the qualities is affected by another.

The second argument has to do with the already mentioned claim that the ingredients can be recovered from a mixture intact. It involves several examples illustrating a recovery of ingredients from a mixture with the help of a catalyst. 24

1.2. Co-presence of blended qualities: ‘heated iron’

‘Heated iron’ is a Stoic stock example of blending. 25 The Stoic author Hierocles, Alexander’s near contemporary, uses it to illustrate the manner of soul’s inherence in body:

Secondly, in addition to this it should be taken into account that soul is not enclosed in body as in a vessel, as are liquids contained in jars, but rather it is miraculously kneaded in and blended with the whole, so that not even the smallest part of a mix is left without a share in participating in either of them. For the blending is most similar to the components of heated iron. For in this case, as in that one, the juxtaposition is by wholes. (Elem. eth. 4, 3–10 Bastianini–Long)

Alexander directs his criticism against the main point of the Stoic analogy. The concept of total pervasion adduced by the Stoics as an explanation of the interactions within the world does not work on the level of the physical mixtures.

But neither is fire mixed with iron, as they say, nor yet with fluids nor wood. For it is generally absurd to say that matter is mixed with form. For the

24 On the structure of Stoic proofs and Alexander’s refutation, see Todt, Common Notions, 88–90; cf. id., Alexander of Aphrodisias, 40–5, 195, with reviews cited above in n. 3.

25 For they say that blending and fusion differ in that with fusion a unity emerges from the bodies that are fused, while none of the bodies in the fusion is preserved either in substance or in qualities; while with blending each of the bodies in the mixture is preserved both in substance and qualities, though the bodies have been blended with one another in their entirety. They say this because they also want to preserve the capacity of the blended bodies to be separated again from one another. Were this account impossible, it would be impossible, according to them, for blending to be complete, or for the bodies that have been blended to be capable of separation (De mixt. 7, 220, 25–37 Brun, trans. Todt).


27 (κεὶ καὶ τὸ ὁλὸν καθότοι ἔγερσά δέ ἐν τοῖς τοῖς) καὶ ἐν τῷ ἔγερσα. Note the use of the term ἔγερσα δέ ἐν τῷ ὁλῷ for the description of blending, here and in Alexander, De mixt. 9, 218, 8 Brun (ἐν τῷ ὁλῷ νάτοράν ἔγερσα).
matter of fire is all things combustible and susceptible to heating, but some of it is indestructible, while the other is not. For this reason some things which have been extinguished quite considerably preserve the same form as they had from the beginning, and yet they are not totally undiminished. For in them, too, something is wasted and destroyed by fire. For which reason these, too, after staying in it longer, are finally destroyed and leave their proper form. (De mixt. 9, 222. 35-323. 6 Bruns)

Alexander here rejects the idea that in the case of heated iron, fire and iron might be mixed without any material losses on either side. In the Stoic argument, the case of heated iron is taken to be of a different phenomenological order compared with other cases of burning. Ordinary combustion involves change and destruction, whereas heated iron illustrates how the quality of heat can spread itself over the whole volume taken up by another quality, that of iron-ness, without destroying any of the latter. Alexander's tactic here is to demote the case of heated iron from its paradigmatic status in the Stoic theory of blended qualities to the rank of ordinary phenomena of burning which play no part in that theory. The fact that there is less destruction in the case of heated iron than, for example, in the case of burning wood is due to the special material constitution of iron. Iron has more 'indestructible' matter than wood has. But this does not mean that all the matter of iron is indestructible. Some of the heated iron does in fact get destroyed,

223. 2 ἀδιαστήμως. The meaning is difficult. Todd explains the distinction as the one between the primary (indestructible) and proximate (destructible) matter: This does not, I think, square well with the following sentence. The illustration of the distinction, where the persistence of form is presumably accounted for by the presence of some 'indestructible' matter. Perhaps we might understand 'indestructible' not in a metaphysical sense but as referring specifically to destruction by fire. The destructible matter will then be the one that is destroyed by fire, the 'indestructible', the one that persists. In any case ἀδιαστήμως will have to be taken in a rare meaning 'not easily destroyed' (cf. Arist. De caelo 1. 11, 280c35: ἀληθῶς δὲ ἀδιαστήμως καὶ τὸ μὲν βαλεόν ὑπερβολῶς). I take the example of things 'extinguished' (lit. 'dried up', ἐκσταθέντα χωρᾶ as referring, in the sense just explained, to the cases like that of heated iron, where form persists for a long time in the process of heating.

33 That qualities are intact is characteristic property of 'blending' (καθάρασις), in the report of Chrysippian doctrine: 'The third type of mixture he says occurs through certain substances and their qualities being mutually coext ended in their entirety and preserving their original substance and qualities in such a mixture: this mixture is blending in the strict sense of the term' (De mixt. 3, 216. 22-8 Bruns, trns. Todd); cf. De mixt. 3, 216. 28-217. 2, cited at 290 above. In this ἀδιαστήμως differs from fusion (ἁμαρτησίας), where 'both the substances and their qualities are destroyed together (μερικοὶ ὁμοίως ἀπολύεται), as he says happens with medical drugs in the joint destruction of the constitution and the production of some other body from them' (De mixt. 3, 216. 22-5 Bruns, trns. Todd, lightly modified).

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and if left in the fire long enough, it would have lost its proper form. Thus, where the Stoics emphasize the moment of stability and persistence, Alexander is inclined by his theoretical background to see a weak mode of destruction. The process may be slow and not easy to notice, but it is there none the less.

The next point that Alexander makes in his discussion of 'heated iron' has to do with the question whether the fire which is used to kindle the iron is identical with the fire which resides in the heated iron after it has been kindled. According to the Stoic account, as presented by Alexander, the fire is the same, preserving its identity and thus being a true continuant. According to Alexander, this is not the case.

In general, since the iron is kindled by a particular fire which depends on specific matter, then, if the fire goes through the iron, it must go through it whilst protecting the matter on which it depended when it was adjacent to the iron; but neither pieces of wood, nor coal, nor any other matter supporting the fire which burns the iron come to be within the iron. So we are left with the fact that fire must come to be in the iron when separated from its matter. But if it is separated, it must acquire new matter in the change, and there is none except the iron itself. For to the extent that there is moisture in it, it becomes matter for the fire. Certainly the iron that is heated becomes harder after its extinction than before, since the moisture in it is expended by the fire, and it is kindled as long as there is some moisture in it—as also with pieces of wood. (De mixt. 12, 222. 26-228. 6 Bruns, trans. Todd)

Alexander's alternative explanation of the example of 'heated iron' is based on his theory of elemental constitution of natural sub-
stances, according to which the heat of fire is to be construed as a property resulting from a mixture of the elements in a hylomorphic compound, rather than as a relatively unattached 'power' or corporeal quality that can subsist qua numerically the same in different combustible stuffs. On the Stoic view (in Alexander's reconstruction), when the iron is heated by a fire that is burning, say, in charcoal, the fire-in-charcoal, being a corporeal quality, exists itself and mixes with the body of an iron bar, so that we can talk about the fire-in-the-iron as of the fire-in-charcoal-and-in-the-iron. On Alexander's view, there can be no such joint monadic properties. Fire cannot have continuous existence on its own, always needing matter in which to subsist, and such matter can only be construed as a constitutive part of some hylomorphic compound. In so far as it resides in the iron, then, it uses the moist within its matter, so strictly speaking it is not the same fire as in the charcoal. The fire in the charcoal is a quality of the charcoal; the fire in the iron is a quality of the iron. There is no substantial continuity between the two 'fires'; the breach is along the border between the two material substances. The physical gap may be elusive, but the logical and ontological gap is there.

1.3. Recovery of qualities: separation of ingredients from mixtures

Alexander's criticism of the Stoic example of the ingredients recovered from blending sets out the difference between the two positions in a particularly clear way. The Stoics illustrated their principle of the persistence of qualities with a procedure of collecting the ingredients from the mixture of water and wine (οὐσίες τοῦ σοφότος) with the help of a sponge soaked in olive oil.

The explanation they gave of this experiment was that wine and water are really present in a mixture, and slight help from a catalyst is sufficient to separate them from it.

Alexander offers an alternative explanation, building on Aristotle's account of mixture in GC 1. 10, according to which mixture in a strict sense is the state of co-present ingredients in which their own 'powers' have been tempered, but not completely annihilated by mutual action. In this case, the original powers of the ingredients are said to be present 'potentially' in a mixture, while the actual power of the whole is a new property, resultant from this mutual action. Alexander adopts this definition, restating it in his own terms.

Alexander does not specify, in the De mixtione, which degree of potentiality the ingredients have, out of the two distinguished by Aristotle. He probably feels the pressure of this question. It cannot be a 'first potentiality', for the process of reconstitution of the ingredients from mixture does not amount to a full-scale generation. Nor is it a 'second potentiality' because the actualization of the latter involves no real process of change at all; whereas here, as Alexander indicates, some process of change is involved.

It is generally held that the Stoic theory of mixture this is a topic that is not yet fully explored. In a recent empirical confirmation, see R. R. K. Sorabji, 'The Greek Origins of the Idea of Chemical Combination', in J. Cleary (ed.), Proceedings of the Boston Area Colloquium in Ancient Philosophy, 4 (Boston, 1989), 35-63 at 48 and n 46.

30 GC 1. 10, 327b22-31: 328b17-22.


32 As Todt aptly points out, Alexander of Aphrodisias, 238-31. F. de Haan in a recent paper has plausibly suggested that Philoponus' view of the ontological status of ingredients in a mixture, according to which the ingredients possess a special third kind of potency, intermediate between Aristotle's first and second, is influenced by Alexander's GC commentary: F. de Haan, 'Mixture in Philoponus: An Encounter with a Third Kind of Potentiality', in H. A. G. Brakhuis and J. M. M. H. Thijssen (eds.), The Commentary Tradition on Aristotle's De generatione et corruptione: Ancient, Medieval and Early Modern (Turnhout, 1999), 21-46 at 35-40.

33 De mixt. 15, 232. 20-31: 'And what is termed the separation of blended bodies neither resembles (οὐ) that involving bodies juxtaposed together, nor again
constitution is facilitated by physical properties of the mixture, moist being the factor which provides for both cohesion and faster movement of ingredients within a mixture. So the reconstitution of components will require less effort than the generation of the same components anew. Alexander describes the process as a ‘superficial generation of something’.

Alexander says that components recovered from mixture in this way are not numerically the same ingredients as were used to make it, but only the ingredients with the same kind of quality:

Thus when certain things are added to them which can contribute to such an actualization, they easily recede to their own nature, not because the original wine and water are separated out again (they were not, that is), preserved in their original state in the mixture, since that would just be juxtaposition and not blending; for where the bodies have been blended the whole product of the blend is one and uniform), but because such a blend is easily able to change into water and does change into that which has not been originally mixed, from such [constituents], with such a quality. (De mist. 15, 231. 22–36; Brunns. Todd, modified)

Thus with Alexander we have the following picture. Mix a volume of water (H₂) with a volume of wine (O₂), producing a uniform blend. Now restore both ingredients in their original volumes. The resulting volumes of water H₂ and wine O₂ will not be identical with H₂ and O₂, respectively. They will be the same in form; their matter, however, will not be continuous with the matter of the original ingredients. For that reason, they will not have complete identity with these latter, although they will be entities of the same kind of mixture.

[b] involving bodies dissociated in corruption and generation and the change into the opposite (as we see when air is separated from water), but the process lies between these. For neither are ingredients present in actuality dissociated, nor are they separated by changing to the opposite of the subject. In these cases (a) and (b) the residue [(κατὰ τὸ διόρθωμα)] after the disassociation stays the same in form [κατὰ τὸ εἴδος] as before and is only decreased in quantity, but [c] with the bodies that have been blended the difference is that each of the things in potentiality in the body produced from the blend is separated out, changing into the actuality of which it was deprived, because they are mutually acted upon to an equal extent! (trans. Todd, modified). (a) and (b) here can be taken as corresponding to the second and first potentiality; the condition of actualization of (a) is a removing of impediment, of (b), an actual change into the contrary, described in terms of generation and corruption.

Alexander of Aphrodias on Mixture and Growth kind, with exceedingly many features of resemblance, and with spatio-temporal characteristics which might suggest identity, if it were not for the gap in continuity created by the state of mixture. Because in the mixture their identities were lost, the recovery is to be taken as a process of generation rather than any sort of accidental change. We shall see in the next section that this approach to the problem of mixture is fully consistent with Alexander’s solution to the problem of the continuing.

Again, as in the case of heated iron, Alexander wants to defate the paradigmatic force of the Stoic example by putting it on a par with several other cases, where ostensibly there is no recovery of the ingredients from mixture yet the causal mechanism, Alexander claims, is the same as he described for the case of separating wine from water. The cases Alexander cites as parallel are the separation of curds and whey from milk into which a heated stone is cast, and the action in fermented must as conducive to a separation of wine from air. In each case, Alexander says, the resultant parts...
2. Alexander on form and matter in the process of growth

According to Aristotle, the persistence of the subject is one of the three fundamental facts (ἀποθέωσις) about the process of growth to be accounted for by a sound theory, the other two being the influx of nourishment from outside and equal increase of a growing thing in all its parts. In his solution to the puzzle of persistence, Aristotle distinguishes between the uniform and non-uniform parts of the organism, and says that non-uniform parts grow by the increment in uniform parts. Growth in uniform parts, the most basic growing structure, is explained by a distinction between form and matter of uniform parts analogous to the same distinction in non-uniform parts. A growing uniform part, i.e. the part constituent of growth in a non-uniform part, grows in respect of form, but not matter. For matter is never the same, but constantly comes and goes. Aristotle illustrates this by an example of water-measuring: form is like a measuring vessel which remains the same in the course of the process, and matter is like water that comes and goes in the process of evacuation and repletion.

It is to be noted that in this general solution Aristotle uses the concept of 'flux' only as an illustration, without explaining its meaning more precisely. This concept has a wide range of possible interpretations, from Cratylean to a variety of restricted versions.

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41 GC 1. 15, 321b18-26, 321b10-16: cf. 321a1-5.
42 GC 1. 5, 321a17-19: τὸ ἄποθέωμα ἀπάθετον τὸ τὸ ἄποθέωμα αἰσθάνεται (ἀναγκαία γὰρ ἐν τούτῳ ἀπαθειά).
43 GC 1. 5, 321a19-24: ἀρχὴ καὶ ἀρχὴ τοῦ τελεῖου μορίου ἐν τούτῳ, ἀπὸ καὶ τῶν ἀλλάτων τοῦ ἐν τούτῳ ἐφανερῶς καὶ γὰρ ἂν ἐλθέτω καὶ τὸ ἐπών μέρος ἀπὸ καὶ ἀπὸ τοῦ ἐν τούτῳ ἐφανερῶς καὶ προηπότητος τοῦ καθότι μὲ τὸ ἐπών ἐλάχιστον, κατὰ δὲ τὴν ἐποχὴν ἡ ἐποχή.
46 For a profound and ample documented analysis of the concept of flux in the descriptions of matter in the Ptolemaic tradition, see F. DeCleene Caizzi, 'La "materia scorrente": sulle tracce di un dibattito perduto' [Materia], in J. Barnes and M.
2.1. Alexander on GC 1. 5: some problems with the sources

The Greek text of Alexander's commentary on Aristotle's treatise *On Generation and Corruption* is lost. Our secondary sources for this commentary include the *De mixtione*, where the last chapter is devoted to the Aristotelian theory of growth; *quaestio* 1. 5, a short treatise in the collection of *quaestiones* attributed to Alexander, which has been transmitted under the title 'Why growth is in form and not in matter'; an Arabic treatise on the same subject which may be regarded as a modified version of this treatise; extensive, often anonymous, quotations in Philoponus' *GC* commentary; and quotations in Averroes' *Epitome of* and *Middle Commentary on* *GC*.

Philoponus often paraphrases considerable parts of Alexander's Mignucci (eds.), *Matter and Metaphysics* (Naples, 1988), 425-70 at 432-3, 443, who draws a useful distinction between the 'radical' concept of flux qua metaphysical principle and a more moderate concept which is used in physical theories of the sensible world.


For the fragments of Alexander's commentary on *GC* 2. 2-5 preserved in Arabic (in Ibarb 6. Hayyad, Kitab al-Tarif), see E. Gannaghi (trans.), *Alexander of Aphrodisias on Aristotle On Coming to Be and Perishing 2. 2-5, Lost in Greek, Found in Arabic*, forthcoming (London, 2004).


Commentary, without explicit acknowledgement. There are, in particular, a number of indications that part of his discussion of form and matter in the process of growth is a paraphrase of Alexander's commentary. These include: doctrinal and terminological parallels with other works of Alexander; an explicit textual marker of a boundary between Philoponus' text and his Aristotelian source; the fact that several statements from this passage are attributed to Alexander by Averroes, in the *Middle Commentary and Epitome* (on which below). These facts provide cumulative evidence that Alexander's text underlies the discussion in Philoponus' passage in question. Averroes' *Middle Commentary and Epitome contain several references to Alexander's commentary. The character of these references does not allow us to decide whether Averroes consulted Alexander's commentary directly. At the end of his presentation of Alexander-
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According to Averroes, Alexander says that not only form, but matter too persists in growth. Averroes' report is embedded in his criticism of Alexander's physiological account of growth, which he apparently takes to stem from Alexander's criticism of Aristotle. But it is interesting that in the course of his own critique of Alexander, Averroes tries to play down the corrective force of the claim that he initially attributes to him, namely that matter persists as well as form. He says that Aristotle never intended to say that growth is in form to the exclusion of matter, but that the distinction has to do with a more specific problem of growth in every part. From this we can infer that Alexander probably said this much in his commentary: in some sense, growth happens in both form and matter.

On the other hand, the title and some of the vocabulary used in the Greek Quaestio 1.5 might produce the impression that Alexander is an advocate of the thesis that form, not matter, is the proper subject of growth. But we may notice that in the Greek Quaestio 1.5 Aristotle views growth as in form: (a) Form is a substance. According to Categories 5.236b-9, "no single substance admits of varying degrees within itself." Therefore, if we say that it is the form *qua* form that grows, it will follow that there will be variations of degree of the same form, i.e., the same substance. (b) Form comes under the category of quality whereas growth occurs in the category of quantity. It was these objections that led Alexander to comment that Aristotle set forth his view merely by way of rhetorical or persuasive argument and not by way of strict demonstrative argument. It is impossible to say whether this is based on another witness to Alexander's commentary; but if so, it would confirm Alexander's tendency to derive the homomorphic theory from the ontology implicit in the Categories (cf. Al. in Sen. 3.73.4-12 Wendland, with my discussion in 'Qualities and Bodies', 309-15).

It is necessary that the words of the Sage should be interpreted in this way, not in the way Alexander interpreted them, when he wanted to explain that growth is in form not in matter in the sense that matter is changing, and growth persistent, and this, as he said, is destroyed by the fact that in the bones there is found persistent matter, so it must be that it is the growing thing. For the Sage did not mean that growth is in form without matter, but only meant that growth in each part of a growing thing is in respect of form and not in respect of matter [see leon yrrid al-bahlim 'unma l-muwatn fi likri t-dima t-mladatt nay la fi t-mladatt diina l-dima la fimma b-laswun yrrid 'unma l-muwatn fi likri t-dima t-mladatt nay la fi t-mladatt diina l-dima la fimma b-laswun yrrid il-tayrati 16 min jhittal t-mladatta'] (Middle Com. 53.3-9 Al-Ashwai). Averroes says here that Aristotle's claim that growth is in form not matter is not to be taken as referring to the problem of persistence, but only to the problem of equal growth. As for persistence, there is persistence in both form and matter. But this is as much as Alexander claims, according to Averroes' report and other sources. So the discrepancy between Averroes and Alexander at this point is not doctrinal, but purely exegetical.
stio, the notion that matter persists is contained in the premises of the statement of the problem; and it is not dismissed by a subsequent discussion. The conclusion can be regarded as a qualifying statement with respect to both claims, i.e. that growth is in form, and that matter persists as well. The author explains that the reason why it is said that matter does not persist is that matter stands for quantity, and form for quality. Because the quantity of a growing thing in the process of growth constantly changes, it cannot be said to persist; hence matter cannot be said to persist in flux, even though some of it in fact does remain. So it seems that the author of the Quaestio agrees with the thesis that some matter persists in the process of growth, and the point of the Quaestio is to show that this thesis is also in agreement with Aristotle’s claim that growth is in form.

The Arabic treatise in particular has a number of features which might suggest that the author defends the thesis that growth is exclusively in form. In the opening paragraph, which has no parallel in the Greek text, we find a mention of ‘some’ who claimed that growth is with respect to both form and matter, to whom Aristotle replies. Alexander is presented as arguing against them for the ‘orthodox’ Aristotelian thesis that growth is with respect to form alone. This impression is strengthened by the final paragraph, also absent in the Greek version, which adds a conclusion along the same lines: matter is flux, but form is stable and persistent; so growth is with respect to form. These emphases are rather at odds with the main argument of the treatise, which assumes that matter does persist, and is replaced only gradually, and follows the Greek title, might suggest a standard dichotomy between the functions of stability and change, similar to that proposed by the Stoic solution of the ‘Growing Argument’ (cf. Phut. Com. 1101, 1063 A–1064 A). But cf. the same language at De mixt. 16. 235. 14–16 Bruna.

Thus, Quaest. 1. 3: 13. 1–16 Bruna. trans. Sharpley, lightly modified.

Quaest. 1. 3 apparently presents yet another instance of discrepancy between title and content characteristic of a number of treatises in Alexander’s Questions collection (cf. Sharpley, Questions 1. 1–2. 15. 3 and n. 11, and R. W. Sharpley (trans.), Alexander of Aphrodisias: Questions 2. 18–19. 12 (London, 1994), 2 and n. 12). See Appendix at 51. 5.

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Quaestio in explaining that form persists in the principal sense in so far as matter is taken to refer to quantity. It seems possible to explain the ‘double focus’ of the discourse by a redaction of the Arabic text in the course of which the mentioned textual and stylistic additions were made.

F. W. Zimmermann has shown recently that the ‘some’ emerge in our treatise (and in a number of other texts translated from Greek into Arabic) as a result of editorial recourse to the technique (which he calls ‘animation’) that involves a presentation of a philosophical discussion of a problem as a piece of real polemic, where the two divergent conceptual points figure as a thesis and an objection maintained by real opponents. In our case, the editor, perhaps misled by the Greek title, chose the claim that growth is in form, not in matter, to be the ‘thesis’ of Aristotle, defended by him and by Alexander against the ‘objection’ put forward by the obscure ‘some’. The substance of this ‘objection’ is in fact none other than the view most of our sources attribute to Alexander himself. The final paragraph of the Arabic text, which has no parallel in the Greek, would also fit well in this ‘animated’ structure: it claims firmly that growth is in form, not in matter, thus suggesting that the purpose of the discussion is to pit this claim against the view that growth in some sense is in both form and matter, rather than showing how the two can be true together.

Now, if these editorial elements are bracketed out for a moment, we can see that the doctrinal points on which the discussion in the Greek Quaestio is based are all retained, if in a somewhat convoluted form, in the Arabic version. To this extent, then, the thesis that form and matter both persist is found in this source too.

2.2. Constraints on flowing matter

The idea that not only form, but matter too, persists in the process of growth, can be found in Alexander’s presentation of Aristotle’s theory of growth in the De mixtione. Where Aristotle, in his account of growth in GC. 1. 5, introduced no constraints on the notion of growth, Alexander, as Zimmermann has shown, appended another stipulation, that growth be directed from matter to form. The passage in our source suggests that the addition was inserted because of the ambiguities of the Greek text.
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all at once but bit by bit (gradual replacement), and some matter must somehow persist in the process. In Philoponus' report of what he calls the 'Aristotelian' account of growth, we find a more detailed discussion of both claims.

2.2.1. Gradual replacement One condition of 'persistence by transmission' is that matter should not be replaced all at once, but gradually. Philoponus' comment on 321b10 contains a discussion of an aporia which most probably goes back to Alexander:

Someone might wonder whether perhaps it is not only the matter of growing things that is not always the same because of influx and outflow, but also the form itself. For if the form has its being in matter as its subject, and it is impossible that when the underlying matter perishes that which has been in it is preserved (for in this way it would have been separable rather than inseparable from matter), then it necessarily follows that neither should the form of a growing thing be preserved the same. (In GC 106. 3-5 Vitelli)

The difficulty arises from the juxtaposition of the following claims about form and matter: (a) 'enmattered form' is always in the matter; (b) matter by definition is never stable, so some of it may be destroyed qua matter before the destruction of the composite (e.g. in the process of evacuation). If that is the case, how can the claim that form persists and remains the same throughout the process of growth hold true? The problem is stated by Philoponus, but the main points of the solutions that follow can be taken as Alexander's with a good degree of certainty. The solution reported by Philoponus is based on the idea of gradual replacement:

Solving this problem we say that, if all of the matter were destroyed at once, then the stated argument would have been correct. But in fact it flows

[ἀνθρωπειώδες] καὶ τὸ ἐξ ἐνδυσή σινιαν αφεθεῖται μεταξεῖς, σωματικοῖς καὶ ἰδέαις ἐλλοιμόσυνα διακόσμησε. 321b10, 11

In addition, he uses the term in his theory of sense-perception to refer to the passage of the objects of the senses through the medium which involves succession, as opposed to instantaneous propagation. The noun form is used 15 times: of these, 12 describing the process of sense-perception (In Sens. 25. 15; 125. 22; 129. 15; 131. 15; 22; 132. 15; 153. 7); Wendland, De anima 41. 5; 48. 15; 206. 16; 160; Quest. 3. 9, 97, 12 (Brun); once in In Meteor. 21. 23 Hadock describing the quick descent of fire; once in Quest. 3. 3, 48. 7 Brun, notably, describing the distribution of divine power from the divine body; and once in our text. Because in our text the nature of transmission involves influx and outflow of matter, it is possible to suppose that by καὶ τὸ ἐξ ἐνδυσήσιμος Alexander means a continuous mode of persistence, where at each moment something flows out, but something persists.
out gradually, part by part, and something else is immediately brought in [instead of the part flowing out]; for which reason the form remains one and the same numerically. (In GC 106, 8–11 Vitelli)

Compare the text of the Greek Quest. 1. 5:

... not all matter in the growing things gets replaced, but while some of it remains, some is added [αλλα μενοντος τους κε αυτην αλλα ζωνανθαι] for [otherwise the growing thing] would not have been preserved from the beginning, nor would the form of the previous matter have persisted. (Quest. 1. 5, 13. 13–16 Bruns)

It has to be noticed that the continuity of gradual replacement does not, strictly speaking, involve a doctrine of physical continuum, or any other special assumption about the physical structure of matter. The meaning of 'continuity constraint' is ontological rather than physical. Continuity and cohesion are recognized as properties of material substances in Stoic physics, as well. But the source of this cohesion, for the Stoics, is the single corporeal active principle, and the way in which it imparts this cohesion to matter is that of corporeal pervasion. Any special provisions for the continuity of matter in individual substances are, on this view, redundant. On

77 The Arabic version: 'Alexander says: We want to solve this problem and we say that in a growing thing matter, i.e. the substrate of that thing, changes gradually [μεταβαλλομενη] For some of it remains, whereas some comes from outside, so that matter does not pass away as a whole; for if all of it did pass away, the form would not remain in its state' (Ls. 5–14 Rualand 51; 9–12 Badawi). It could conceivably be realized in a discrete material system, provided that there is a mechanism synchronizing the processes of destruction and replacement. Cf. e.g. Aristotle's argument against the assumption that everything in nature is subject to motion in Phys. 8. 3, 235b13–23: ουτε γάρ ανατέλεται τινῶς βίωσιν αδό τε συνέχεις, άλλ' έστι καί τό μέσον. έστι δ' ημών καί λόγος τής περι τάν συναγωγήν καταστράφησιν καί τά δεξαμενά τούτος λίθος διατερεῖ ού γάρ τά νυντικά έκθεσιν ού δαβηκεν ανατριπτερα, καί τά μεν ημών τό είση πυρός πρωτόκος άλλ' άντων ή μεταλειποῦν, καί αν ανα τελειωθήσει ταυτόν και τά μεν μερες αντων άντων τοις τοις τοις. διαπρέπεται μην τό ωδεροθεν εις έκθεσιν, άλλ' άντων αντων διοικηθει χωρει, άλλ' έστιν. φανερον αυτο ους ανα τελειωθήσει ταυτόν και τά μεν μερες αντων. Aristotelean physics rejects atomism, because it cannot come to terms with the assumption of anything indestructible and unchangeable in the physical realm. S. Berryman is right in pointing out that Philoponus' passage can be interpreted in two distinct ways. C. J. F. Williams (trans.), Phileonos on Aristotle On Coming-to-Be and Perishing, 1. 1–5, introduction and supplementary notes by S. Berryman (London, 1990), 182. 350.

The Stoics did accept some version of the 'Cratylus' assumption of the 'Growing Argument': cf. Plut. Comm. nat. 1683 B. Declefa Caizzi points out that this is the sole place where such an admission by the Stoics is recorded (Materias*, 447), but the idea that cohesion is imparted to matter by the active principle is well attested in the Stoic sources. In the extant fragments, we find a report of Menaechus, who argued for a distinction between the 'peculiarly qualified' and 'substance', saying that Socrates' substance can exist both before and after the existence of Socrates (Stob. Ed. 1, 207, 139. 3–17 Wechcular–80a LS, part). The discussion of the mode of existence of Socrates' substance is not preserved, but even if we assume that it exists as a quasiaggregate dispersed in the cosmos in whatever manner, no special condition need be applied to it when it is a part of Socrates, other than being pervaded by the active quality-setting body.

2.2.3. Persistence of matter The argument for persistence of matter has been mentioned above in Avemrores’ report: some part of matter

Alexander’s view, the universal cause of continuity of matter is the uninterrupted movement of heavenly spheres. This provides for the recurrence of kinds in the sublunary world—and so for the fact that this world is arranged in terms of species each of which is covered by a sortal concept. The continuity of matter is a common feature across species, but this does not mean that it has the same ontological and physical parameters in each species. In each particular case, the continuity of matter has a specific pattern set by its form. This form, unlike the Stoic active principle, is incorporeal, and it cannot be construed as a separately existing entity of any sort—neither, obviously, as a thing, nor indeed as a corporeal causal factor operating across a variety of individuals. Thus special provisions for the matter of individual substances must be specified in terms of a given kind.

Gradual replacement provides for a continuity of matter over any given period of time. If this were the only constraint on matter as flux, there would be no reason why material substances could not be eternal, given a persistent form and a virtually infinite supply of matter, along with the 'gradual replacement' mechanism. But Alexander’s enmatured form (unlike the soul-model of Cebes’ ‘tailor’ example at Phaedo 66 a 6–68 c 7) is entitled to only one round of existence, within a particular hylophone compound which it does not survive. To account for the destruction of things in nature, he introduces another postulate, according to which some matter of an individual has to persist over the whole lifespan of the individual.
remains because otherwise it would be possible for form to exist separately from matter.\(^{77}\) It is cited in a fuller form by Philoponus:

\[\text{[i] But neither should one think that all of the matter is replaced by turns as a whole in the course of time, flowing out part by part, so that in our old age something would remain in us of the body that was underlying us from the beginning, from the original structure. [ii] If this were the case, it would have been possible for animals to be immortal, matter always being in its prime. [iii] For as things stand now, matter cannot preserve form throughout because of wearing out over time, since the harmonized [components] being affected by the opposite powers cannot retain the harmonia and blending throughout. [iv] Hence it should be understood that not all of it gets dispersed, but the more solid parts of it always remain numerically the same. This is why the scars from injuries which happened perhaps in youth can be seen remaining in flesh and bones till death. So for this reason too form must necessarily remain numerically the same.} (In GC 107, 3-14 Vitelli)

This report may well be contaminated. Alexander is not mentioned, and the accuracy of Averroes' report is not exempt from question. The idea that solid matter persists while soft parts get replaced may come from anatomical observations which have nothing to do with the metaphysics of hylomorphism.\(^{78}\) None the less, the main concern, stated in two different ways in Philoponus (ii) and Averroes—that if matter did not persist, form could exist without matter, and animals could be immortal—most likely goes back to Alexander, who was the proponent of the theory of 'ennertated form', and the right kind of person to entertain such worries. A parallel with (iii) is found in Alexander's school treatise Quaestio 2. 20, where the processes of perishing in living substances are explained by the inability of the elements to retain in due proportion the powers on which the functioning of a living being depends.\(^{79}\)

\(^{77}\) See above, sect. 2.1 and n. 66. This report occurs also in the Epitome: 'But this is not possible in all parts of matter, for otherwise it would be possible for the enmertated form [al-shina al-hayyilalayyi-d] to exist separately [from matter], but only in some of its parts. Alexander brings evidence that in the animal there are parts which persist from its coming to be to its passing away, from the traces of some wounds which remain in it throughout its life's span' (Rip. 13. 10-12 Puhl)

\(^{78}\) I am grateful to Richard Sorabji for this point and for discussion of this problem.

\(^{79}\) [But when this proportioning [equivocale] is dissolved, since the things from which [the living beings] came to be change and do not preserve the powers in regard to which the proportioning [took place], there comes about a dissolution and breaking up [of the living beings], not into the things, which are no longer

In Philoponus' commentary, the replacement of matter counteracts and slows down this process of perishing, while not being able to cancel it out completely. In Alexander's Quaest. 2. 20, the amortizing effect of replacement on perishing is not mentioned (but the main problem of the treatise is rather specific). Thus, although we cannot be absolutely certain that the whole solution to the problem offered in Philoponus' commentary is by Alexander, we may note that the main theoretical components of this solution (the account of perishing, the compensatory role of replacement) are found in the works of Alexander, and the problem itself can be most naturally thought of as arising in the context of his hylomorphic theory of growth: some provision for the non-token persistence of matter has to be made lest the theory of 'ennertated form' lose its ground.

This kind of reasoning can be easily misconstrued as saying that matter is, after all, the subject of growth, in some way. As both the discussion of the aporia in Philoponus' commentary at 106. 3 Vitelli and Quaest. 1. 5 show, the possibility of such misinterpretation was well realized in Alexander's circle. Quaest. 1. 5 is an attempt to address this difficulty. The claim that matter is preserved in the course of growth is one of the assumptions; the task is to show that this claim is compatible with the Aristotelian thesis that growth is with respect to form. The solution of the problem appears to be that matter does not persist in the process of growth in so far as it is taken to represent the quantitative characteristics of a body, 'form' standing for quality. But this method of distinguishing between matter and form is not the only one, and perhaps even not the principal one, the author says:

It is not in the being of such-and-such a size that matter has its being matter, just as this is not the case for flesh. (Quaest. 1. 5, 13. 16-17 Bruns)

preserved in them, like the pioneers (for these themselves too were composite, and this composition [took place] after the first mixing and joining together [μετα τὴν πρώτην μιξήσιν καὶ συνενέργειαν] of the [ingredients] from which the bodies of living beings are composed). But, when there is a change in the things from which these bodies [were composed] (and these were the elements, which were preserved [in the compound]), they are dissolved apart from one another, when a disproportion is brought about between them by the one of them that gains the upper hand (since they do not have the power to keep this proportioning indefinitely), and the perishing of living beings and other composite bodies leads to the dissolution of those elements from which their coming to be and composition [took place] in accordance with a certain proportioning of the elements to one another (Quaest. 2. 20, 64. 31-65. 7 Bruns, trans. Sharples, lightly modified).
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This difference has been anticipated already in the discussion of mixture. For Alexander, the discontinuity of material substrate accounted for the numerical distinction between the qualitatively equivalent ingredients. On the Stoic view, the numerical identity of an ingredient before and after the mixture is sufficiently determined by its qualitative identity. In Alexander’s discussion of growth we have the same principle of material continuity and persistence spelt out in a more detailed way. This principle is invoked again in his discussion of the Stoic doctrine of everlasting recurrence.82

In his commentary on GC 2. 11, Philostrus reports an aporia whose proponents suggest that the everlasting recurrence of individuals should follow from the sameness of both efficient cause and matter in sublunar cycles.83 It is not clear whether the aporia had the form of an objection to the Aristotelian theory or, perhaps no less likely, we are dealing with a Stoicizing interpretation of Aristotle’s chapter. Alexander’s reply is that even the coming to be of individuals with exactly similar properties would not be a recurrence of numerically identical individuals, but only of the individuals which are the same in kind, however much resemblance they might bear to their past counterparts:

To this it should be said that even had it been granted that Socrates comes to be again, the Socrates that has come to be later would not have been one and the same with the first Socrates. For one and the same thing cannot be divided by an interval [διαλείπειται]. For a numerical unity about which depends, not due to being made up by the same things, but due to the fact that it remains the same before and after [κατά αὐτήν διαλείπειται πρὸς τῆς διαλείπεται δε], for this reason, the sun is numerically one, but Socrates, as he said, of Identity’, Phronesis, 27/3 (1982), 355–75 at 365–70. The whole question clearly needs further investigation.


83 apōfrasei δὲ ἐν τῷ, ἐν φθόνῳ Αἰχμαλωτικοί, πρὸς Ἀριστοτέλην εἰ γὰρ ἡ ἄρτες ἔχει διαφέρουσαν, ἐν μὲν τῷ αὐτῷ ἐνδύματα ἔχει τὸν αὐτὸς ἔχειν καὶ ἐν οἷς αὐτὸς ἔχει, ἐν οἷς τοῖς μιᾷ καὶ τῆς ἀναφερόντες καὶ τὸν μᾶλλον ἐνδυτὲς, εἰ δὲ αὐτῶν τῷ αὐτῶν ἐνδυτέρας γίνεται (Philo, in GC 314. 9–16 Vitelli)
identity and persistence through change. None the less, Alexander's polemic, with its distinct theoretical preferences and biases, can prove useful for the analysis and assessment of historical alternatives.

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APPENDIX

Treatise of Alexander of Aphrodisias (stating that) growth and augmentation indeed have to do with form and not matter

Edition 61 by Abū 'Uthmān al-Dimashqī

51. 5: [Alexander said]: Aristotle in the book 'On coming to be and passing away' mentions that growth and augmentation are in form, not in matter. Some62 denied that, saying: the body,63 and whatever admits of growth, only grows in both its form and its material.64 And65 the philosopher said: Growth happens in form, not in matter.

51. 9: [Alexander said]: we want to solve this problem, and we say: the matter, i.e. the material of a given thing, only grows gradually in the course of growth. For some of it persists66 and some comes from without, so that the matter does not disappear altogether. For if all of it were to pass away, then the form would not persist the way it is.

61 This translation (appendix only for the sake of illustrating the argument) is based on the edition by A. Badawi, Shurūb 'alā Aristā: commentaires sur Aristote perius en grec et autres épitres (Beirut, 1971), 51-2. For critical edition with German translation see Ruland, 'Wachstum'. See also Zimmermann, 'Proclus Arabus', 20-37; Sharples, Questions i, 1-2; 15; H. V. Brown and F. W. Zimmermann, 'Neue arabische Übersetzungserate aus dem Bereich der spätantiken griechischen Philosophie' [BZ], Der Islam, 59/4 (1973), 313-24. I am particularly grateful to Dr Heidrun Eichner and Dr Fritz Zimmermann for discussion of this text and checking my translation. I am responsible for any errors that may remain and any misuse of their advice.
63 51. 7: 'Some': the invented addressees of Aristote's and Alexander's polemic. See above, 318-19.
64 51. 6: ibid. Ruland suggests that it might stand for ἐκφάγε.
65 'ἐτοπεύω: a more archaic term for matter than ἁμάλθα, with which it is used interchangeably in this text. The use of two terms might be evidence of two redirections (cf. 51. 9 below, where ἁμάλθα is glossed with ἁμάλθα), but could also be an attempt to use two different terms to render a distinction drawn in Greek between 'matter' and 'substrate' (cf. Quaest. i, 1. 5. 12; 11-12 Bruna).
66 Reading fa-nimma qaṭṭa with T (fa-finna fa-qaṭṭa) is unvid.: fa-qaṭṭa Ruland: fa-thumma qaṭṭa Badawi: fa-limma qaṭṭa ('to this') Zimmermann, 'Proclus Arabus', 21.
67 Reading with B and Ruland yanbā. 
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persistence even though matter changes. And therefore growth only happens in the form of something alone.

Hereby is clearly explained the saying of the Philosopher that growth happens in form but not in matter.

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--- 'Mixing Matters', in Oderberg, Form and Matter, 65-75.

51. 1: Again: the form of something and its matter grow together, matter being like quantity and form like quality. And the quantity of a thing moves and alters, and does not stay as it was before. Its quality, on the other hand, which is [its] form, persists and stays as it was before. Since the quality of a thing, i.e. its form, is persistent, while [its] quantity is changeable, and not persistent, the cause of its change and fragility is in the flux of matter—therefore the Sage said: the things that grow do not grow* in matter; but they grow in form.* For form persists in its initial state without change; but movement and growth happen in respect of something subsistent and stable.

51. 19: Again: even though a growing thing grows in both its matter and its form, yet because of the state of flux of matter, i.e. the material, growth is not to be predicted of the material, because the material, as we said, changes and does not persist in the same state. So if a pricking were to be made with respect to it, only changeability and mutability of matter would be predicted of it. For we cannot find in a growing thing the material (which is persistent throughout, not divided, but it changes with respect to quantity, i.e. every part of the matter of a growing thing) flows and changes so that none of it remains in its initial state. On the other hand, the form of that which grows remains constant as long as the growing thing subsists without undergoing destruction.

52. A. Again: growth is a kind of movement, and movement only comes about in respect of something that is at rest. And we have said that form...
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