
Contemporary Hylomorphisms: On the Matter of Form

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Abstract

As there is currently a neo-Aristotelian revival currently taking place within contemporary metaphysics and dispositions, or causal powers are now being routinely utilised in theories of causality and modality, more attention is beginning to be paid to a central Aristotelian concern: the metaphysics of substantial unity, and the doctrine of hylomorphism. In this paper, I distinguish two strands of hylomorphism present in the contemporary literature and argue that not only does each engender unique conceptual difficulties, but neither adequately captures the metaphysics of Aristotelian hylomorphism. Thus both strands of contemporary hylomorphism, I argue, fundamentally misunderstand what substantial unity amounts to in the hylomorphic framework – namely, the metaphysical inseparability of matter and form.

Keywords: substantial unity, causal powers, form; actuality, potentiality, activity

Introduction

Recent years have seen a rise in the popularity of neo-Aristotelian approaches to metaphysics, a phenomena especially apparent in the contemporary utilisation of dispositions, or ‘causal powers’: the same properties which once regularly incited ire within the reductionist paradigm prevalent in the early half of the century are now rather commonplace features in ontological analyses of everything from theories of mind to interpretations of quantum mechanics.¹

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As a recognition of the theoretical prowess of the concept of ‘potentiality’ in the realm of modal metaphysics has become more widespread, it’s only natural that philosophers have begun to re-examine and re-evaluate that Peripatetic postulate’s most complex and controversial application – the doctrine of hylomorphism. Though it is perhaps often caricatured as constituting the height of scholastic obscurity, hylomorphism does attempt to provide an answer to what is still widely considered a fundamental question in contemporary metaphysics: in what does the *oneness*, or *ontological unity* of an entity consist? In recent times, this question has typically been interpreted as one which requires the tools of mereology to adequately approach, and philosophers who place themselves within the Aristotelian tradition have accordingly understood hylomorphism as providing a viable and attractive answer to the ‘Special Composition Question’.²

In this paper, I argue that this characterisation of hylomorphism is problematic: it gives rise to a number of conceptual problems which stem from what I view as fundamentally mistaken readings of Aristotle’s doctrine. My contention is that the two most common forms of hylomorphism in the contemporary literature suffer from a complementary deficiency – in that each only incorporates *half* of the hylomorphic doctrine – and as a result, both misconstrue the hylomorphic solution to the problem of substantial unity. For, as I will show, while according to hylomorphism the unity of genuine substances principally consists in the metaphysical union of ‘matter’ and ‘form’ this is, in stark contrast to contemporary accounts, a coupling which is neither causal nor compositional. That said, the aim of this paper isn’t to disparage or otherwise discourage the examination of contemporary forms of hylomorphism *per se*: indeed, there is no doubt that many of these may have useful philosophical applications, perhaps even within areas in which Aristotle’s hylomorphism could not. Rather, the hope is that highlighting what I take to be Aristotle’s unique and (at least by today’s standards) unorthodox account of substantial unity will encourage future conceptual work which builds on its foundation to be done and thus further the revitalised exploration of the richness of Aristotelian metaphysics.

Aristotle’s Hylomorphic Account of Substantial Unity

That Aristotle considered an account of ‘substantial unity’ to be among the central pillars of his metaphysics is clear. Detailed examinations of

the topic appear not only where one might expect – in the *Metaphysics* and the *Physics* – but in his psychological treatise *On the Soul* and in his biological works (e.g. *On the Generation of Animals*) as well. The ‘hylomorphic’ account of substantial unity, developed and defended in a multifaceted project undertaken throughout the breadth of the Aristotelian corpus, is today well-known for being rather idiosyncratic: determining the plausibility of drawing the ontological dividing line between *mere aggregates* and *unified beings* by an appeal to the ‘union of matter and form’ requires a fair amount of familiarity with the distinctively Aristotelian approach to philosophical problem solving. What is today by and large under-appreciated however is the extent to which Aristotle’s hylomorphism – insofar as it represents an approach to defining substantial unity that is not only unique, but almost entirely orthogonal to any similar such attempts – is a metaphysically *radical* account.

Most (previous and current) accounts of substantial unity generally fall into one of two camps, taking the ontological distinction between *many beings* and *one being* to consist in either (a) the latter’s being composed of parts which are fastened together in some privileged fashion, or (b) the latter’s parts being operated on by some causally privileged property. But according to the interpretation of Aristotle’s account that I favour, as I discuss in more detail below, substantial unity is neither (a) a mereological matter, nor (b) a causal affair – and thus (contrary to how it is nowadays conceived of) such an account fails to fit neatly into either camp. In short, this is because I take hylomorphism to have a focus entirely distinct from that of either of those camps: on the hylomorphic framework, substantial unity does not concern the part-whole relation *per se*, but rather the relation so fundamental to Aristotelian metaphysics – the one that holds between *potentiality* and *actuality*. For according to my interpretation of Aristotle’s hylomorphic framework, the distinctness of ‘matter’ from ‘form’ is not grounded in the ontological partition which could be drawn between an ‘unorganised collection of stuffs’ and a ‘causal power’ or ‘structural relation’, but in the metaphysical division between *capacity* and *activity*, or *organ* and *operation*.³

The best way to motivate this interpretation and begin to get a grip on this distinction is by noting the way in which ‘form’ is explicated throughout the *Metaphysics*. In an expansion upon the discussion in Z concerning the ‘what it is to be’ of an entity (its ‘definition’, or ‘formula’) that begins in H and continues into Θ, Aristotle makes it clear that the form of an entity is to be identified

with its *function*, in the sense of *activity* – it is the *work* (*energos*), or the *being-at-work* (*energeia*) of its body. The form of an entity, in other words, as introduced in the *Metaphysics* and significantly expanded upon in the biological works, is identical to its characteristic function or activity: the very operation of its *life qua* an entity of that kind.⁴ In making this point plain, and for the purposes of illustration, Aristotle utilises a variety of analogies. Sometimes he utilises examples involving artefact analogies – he states, for instance, that the ‘form and actuality’ of a house is its serving ‘as a covering for bodies and personal possessions’ – and sometimes organic ones – musing, for instance, that if ‘the eye were an animal, sight would have been its soul, for sight is the substance of the eye which corresponds to its form’.⁵ What both of these sorts of examples are meant to illustrate is that form is to be understood as the *active performance of a particular function*.

With this in mind, the interpretation of Aristotle as understanding ‘form’ to be one metaphysical half of the potential-actual relation explored at length in *Metaphysics* Θ is, I think, compelling. On this reading, form is the actualisation, or activity of capacity, or potentiality: the form of an eye is the *activation* of the ‘capacity for sight’, and the form of a house is the *realisation* of the ‘potential for sheltering’.⁶ Thus the collection of capacities whose activation comprises the operation of an entity’s proper function constitutes its ‘matter’: the eye – *qua* an organic constitution of lens, retina, and nerves – is said to function as ‘the matter of seeing’, and the ‘stones, bricks, and timbers’ the ‘potential house, for these are the matter. Importantly, contrary to what might seem to be suggested by such examples, what marks something out as the ‘matter’ of an entity is not, strictly speaking, what it is ‘made out of’. As reflected in the careful phrasing above, what *matters* isn’t mereological: the ‘material’ constitution of an entity (in our example, the nerves, wood, etc.) is relevant *only insofar as* it is a collection of capacities *for* a particular function.⁷ This slightly subtle point is in fact what I take to be the conceptual foundation of Aristotle’s somewhat infamous endorsement of the ‘homonymy principle’, according to which when, for instance, a fox dies, what remains is *not* the body, or matter of the fox.⁸ To my mind, Aristotle held this principle because, even though there may remain a perfectly preserved, structurally intact organic mass, there now exists nothing which has the *capacity for foxiness*, nothing which is *potentially fox-ing* – that is, nothing which could actively generate the functionally integrated and homeostatically maintained organismal

system by which the 'way of life' (the *bios*) particular to foxes is carried out.⁹

Already from this abridged summary of my interpretation of Aristotelian hylomorphism we can see that while the framework does place an important emphasis upon the *dynamic* nature of form, that 'dynamism' isn't of the sort typically appealed to in accounts of substantial unity – i.e. the form is not here conceptualised as a privileged sort of property whose causal operations bring together an entity's otherwise mereologically disparate parts. For forms are not dynamic in virtue of their *acting on* matter, but rather in virtue of their *being the activity of* matter. Thus, according to this interpretation of Aristotle's doctrine, the reason that artefactual 'forms' can only ever be *analogous* to (real, genuine) forms is not because they aren't *powerful* and so have no *effects upon* their matter, but because they aren't the *exercise of* any powers of that matter: there is no sense in which, for instance, the 'architectural configuration' of a house constitutes the *activity* of its constituents; the stones and bricks don't possess *capacities for* 'house-ness' whose activation amounts to their being configured in certain fashions. Indeed, even putting that point aside, I think there is a more fundamental and straightforward reason why, for Aristotle, forms *cannot* be powers which act *upon* matter. For unlike our contemporary conception of dispositions whose 'manifestations' consist in their bringing about some *extrinsic* state of affairs, an Aristotelian power's manifestation is an essentially *intrinsic* process of transition, from one 'state of being' to another.¹⁰ Forms however, unlike powers, do not intrinsically *change* states of being – they do not themselves pass from potentiality to actuality – but, as Aristotle makes clear, *are* a particular state of being: namely actuality, or activity itself.

According to the 'potentiality-actuality'-based interpretation of Aristotle's doctrine that I favour then, the unity of substances isn't the effect of any causal power. Furthermore, as hinted at above in the discussion of the non-mereological nature of 'matter', that doctrine's account of substantial unity has nothing whatsoever to do with an entity's parts being fastened together in any particular fashion or being arranged according to some structural specification. For on this view of Aristotle's hylomorphism, substantial unity is not secured by an entity's matter *being made one by* its form, but by its matter and form *being one* – and this is a metaphysical, rather than mereological sort of unity. To appreciate the difference, consider the way in which, in the *Metaphysics*, after having dismissed his predecessors' various attempts to solve the 'difficulty' of the 'cause of unity' of substances,

Aristotle concisely restates how his hylomorphic framework encounters no such problem:

But, as has been said, the matter and the form are merely two aspects of an identical reality, the one with respect to a thing's capacities, the other with respect to its actual operation [...] for each individual is a unity, and its powers and actual functioning are in a sense one- (1045b17–22)

As this summary passage seems to indicate, according to Aristotle, substantial unity obtains whenever an entity's matter and form are *metaphysically inseparable* – that is, whenever its capacities and activity are *one* (and are thus unable to be conceptually 'pulled apart' by an effort of abstraction, as detailed below). In the *Physics*, Aristotle employs this notion of 'separability' when distinguishing between the way in which the physician (who studies *natural* entities, genuine substances) and the mathematician study 'form':

The next point to consider is how the mathematician differs from the student of nature [...]. Now the mathematician, though he too treats of these things, nevertheless does not treat of them as limits of a natural body [...]. That is why he separates them; *for in thought they are separable from motion, and it makes no difference, not does any falsity result, if they are separated*. The holders of the theory of Forms [i.e. the Platonists] do the same, though they are not aware of it; *for they separate the objects of natural science, which are less separable than those of mathematics*. (193b31–194a5, my emphasis)

To understand what the claim that the 'objects of natural science' are 'less separable' than those of mathematics amounts to, consider Aristotle's description of the separability of form *from* matter characteristic of the mathematician's study in *On the Soul* 403b13–15: the forms of mathematical objects, he states, are 'inseparable in fact, but are separable from any particular kind of body by an effort of abstraction'. If the forms of the objects of natural science – genuine substances – are *less* separable from matter than those of mathematical objects then, they must not only be (a) inseparable in the way that *all forms* are *actually* inseparable from matter, in that there are no 'free floating' forms (they are 'inseparable in fact'), which the mathematician can also affirm, but also (b) inseparable in the way that mathematical forms *are* separable – namely, metaphysically, as discerned by 'an effort of abstraction'.¹¹

According to Aristotle, artefacts are *not* genuine substances precisely because their 'matter' and 'form' have only an *accidental unity*, and thus can be conceptually 'pulled apart'. As an example of this notion at work, consider a house *qua* hylomorphic compound – a collection of

stone and wood (matter) performing a sheltering-function (form). Even if this collection is currently exercising its capacity to perform a sheltering-function, we can note that it is not defined by its ability to do so: performing that function is in fact incidental to that collection, and it may have performed any number of other, entirely unrelated functions; it could have, for instance, performed a catapult-function instead. Furthermore, we can note that the ability to perform the sheltering-function is not the unique purview of that collection, as it is one which could be carried out by any number of distinct collections of varying compositions – given, that is, that ‘sheltering’ need not be done by stone and wood.¹² Taking these two points together reveals the ‘accidental’ nature of the unity this hylomorphic compound possesses: for because it is one thing *to be a collection of stone and wood* and another *to be capable of performing a sheltering role*, in the case of this house, what operates as ‘matter’ doesn’t intrinsically and essentially do so – and it is thus not *one* with its form.

Contrasting the hylomorphic analysis of an artefact with that of a genuine substance – an organism – casts this point in sharper relief. For according to Aristotle, the particular collection of functional parts and organs that make-up an organism do not do so *accidentally*, in the sense outlined above: that collection’s capacity to perform certain characteristic life-activities is not merely incidental to it, and the operation of those activities necessarily consists in the activation of that collection’s capacities.¹³ The form and matter of an organism are in this sense *one*, for what the parts which make up the latter *are* is fundamentally tied-up with, and is *inseparable from*, their role and function with respect to the former.¹⁴ Thus because it is *not* one thing *to be a specific collection of parts and organs* and another *to be capable of being that organism*, what operates as matter in genuine substances intrinsically and essentially does so. For this reason, the matter and form of these hylomorphic compounds – unlike houses, spheres, and statues – are unable to be conceptually pulled apart by an ‘effort of abstraction’ and are, according to Aristotle, genuinely unified substances.¹⁵

Invoking the aforementioned ‘homonymy principle’ offers another, perhaps more ontological perspective on the hylomorphic non-separability of genuine substances. In the *Metaphysics* (1036b24–31), after asserting that ‘assuming it is possible for a man to be/exist without [particular sorts/certain kinds of] parts, as there may be/exist a circle not of bronze, leads one away from the truth, Aristotle expands upon and explains this non-separability with an appeal to that principle by

stating that '[f]or it is not the hand in just any state that is part of the man, *but only when it can perform its activity* [work, or function], hence when it is alive; and *when it is not alive, it is not a part* [of the man]' (my emphasis). With the capacity-based definition of 'matter' given above in mind, the homonymy principle thus entails that, in the case of a genuine substance *S*, there can be no *potentiality to be S* where there is no *activity of being S*: the dead hand does not qualify as the belonging to the matter of a man precisely because it is no longer engaging in 'man-activities'. According to Aristotle, in other words, as Kosman (2013: 178) succinctly puts it, 'there is nothing that we should describe as having the ability to be a human being that is not actively being so'. In the case of genuine substances then, the *unity* of matter and form (*qua* capacity and activity) is not just a conceptual, but is also an ontological affair: the matter of a genuine substance *only exists when its form does*.

By utilising this implication of the homonymy principle then, we can perform another 'effort of abstraction' in a way which allows us to understand the sort of metaphysical inseparability which characterises the hylomorphic unity of genuine substances in a more robust fashion. We can conduct what might be called an 'existential extensional overlap test' by considering two sets, the set of things that *have the capacity to do F* and the set of things that *are doing F*, and asking whether, for some purported substance whose form is *F*, the members of these two sets 'overlap': if they do – if there is a bijection from the *potentiality* set to the *actuality* one – then the substance characterised by *F* is a genuine substance; if they do not, that 'substance' possesses a merely accidental unity. Consider first our earlier example of a house: is the set of existing things that *have the capacity to be a house* extensionally equivalent to the set of things which exist that *are houses*? Clearly not – a timber-yard, for instance, contains many collections of entities which have the *capacity* to be a house but which *are not* houses. In the case of 'house', matter and form are *not one*, precisely because the capacity to perform a sheltering role can (and does) '*exist*' *without*, or in the absence of that role actually being performed. Compare this case to that of an organism – turtles, for instance: is the set of existing things that *have the capacity to be a turtle* extensionally equivalent to the set of things that *are turtles*? According to my interpretation of Aristotle, and in line with the homonymy principle, the answer is yes – there do not exist any structurally organised collections of parts which *could* be turtles but are not, as the only existent such collections which have that *capacity* are those *actively* exercising it. Here then matter and form are *one*, as the capacity

to perform the life-functions and characteristic activities of turtles cannot 'exist' without, or in the absence of those functions being actively exercised.

Substantial unity on the hylomorphic framework as I understand it thus consists in an entity's matter and form being *one* – that is, being metaphysically inseparable, both conceptually and ontologically: for the matter of a genuinely unified substance must be such that it is essentially, rather than merely incidentally, the capacitive ground for the activities which define that substance's form *and* such that the potentialities which comprise it depend for their very existence upon being operatively engaged in those activities. This is, at least in the context of contemporary accounts (as we will see), a radical account of what it is for an entity to possess 'substantial unity'. Because the *oneness* of unity in the hylomorphic framework is *metaphysical* rather than *mereological*, accounting for substantial unity neither requires an appeal to some privileged way in which an entity's parts are fastened together, nor to the effect of any privileged causal power it possesses.

Forms of Form: Principles of Unity

The doctrine of hylomorphism is, without question, no longer philosophically *en vogue*: those who haven't relegated it to the dust bin of ancient esoterica are likely to have judged it as entailing more conceptual problems than it solves. With the rise of Aristotelian metaphysics in contemporary philosophy however, recent years have seen its advocates increase, its tenets reformulated and reinterpreted. As it stands, contemporary proponents of hylomorphism have put the doctrine to use in an impressively wide range of applications – foundational issues in the realms of quantum mechanics, developmental biology, and consciousness (among others) have all received hylomorphic analyses in the recent philosophical literature.¹⁶ This many-fronted and multifaceted rediscovery of the doctrine, as one might expect, has not resulted in theoretical uniformity among its pioneers, and no two contemporary forms of the doctrine are exactly alike. One can however I think discern two main *types* of hylomorphism into which most of its contemporary forms fit according to their respective characterisations of the most crucial (and contested) conceptual component of the doctrine – 'form'.¹⁷ My aim in the following two sections is to show not only that neither of these two types offer an account of substantial unity which is properly

'hylomorphic' (in the sense explicated in the preceding section), but that both accounts engender various conceptual difficulties with which Aristotle's doctrine is unburdened.

The first type of hylomorphism prevalent in the contemporary literature comprises those accounts which conceptualise 'form' as a structural relation that holds among an entity's parts that functions as a *principle of unity* under which they are collectively integrated into an ontological *whole*.¹⁸ On this type of account, the form of an entity is a relation that specifies *which sorts* of parts belong to it (as proper parts) and *in which way* those parts are configured (in relation to one another): the most commonly given paragon of this sort of relation is the 'valence bonding structure' which defines particular molecules.¹⁹ According to this conception of hylomorphism, in virtue of their functioning as Lockean 'real definitions' (or perhaps better, as the Aristotelian 'what it is to be') of mereologically complex entities, forms explain what their genuine substance-hood consists in – namely, in being *these sorts* of 'material' elements being arranged in *these ways*. Thus Johnston's (2006: 658) 'canonical statement' of hylomorphism:

What it is for...(the item is specified here)...*to be is for...*(some parts are specified here)...*to have the property or stand in the relation...*(the principle of unity is specified here)...

For the student of the *Metaphysics*, the above phrasing will no doubt be familiar – for in making the connection between 'definition' and 'form', Aristotle offers a similar construction:

If a definition of a threshold is required, we should say 'wood or stone in a certain position'...in the case of ice, 'water frozen or solidified in a certain way'. (1043a7–12)

On the 'principle of unity' conception of form, the entities which are *ontologically one* – i.e. those that are genuine *wholes*, rather than merely aggregate *sums* – are so in virtue of their being composed of a particular collection of parts (matter) in a particular configuration (form) in such a way that the former, as Koslicki (2008) puts it, 'satisfies the 'structural constraints' specified by the latter. Hylomorphic unity, on this type of account, is thus a species of the sort of unity which holds among 'relata' more generally – the *many* are united as *one* by means of their common membership in the structure of a single relation. Indeed, advocates of this conception of form might be understood as holding to a particular type of (non-eliminative) 'structural realism': structural relations may not be 'elements' of the physical world – in the same way

that say, quarks and leptons are – , but as that world is not, as Hume might have put it, a fundamentally ‘loose and separate’ amalgam of mereological ephemera, we are (at the very least, epistemologically) committed to their existence.

Advocates of this ‘principle of unity’ type of hylomorphism maintain that its characterisation of ‘form’ has the potential to play a vital explanatory role in meaningfully addressing some central questions on the subject of substantial unity. On the one hand, the continued individuation of compositionally complex entities is sometimes said to be grounded in their possession of a form (*qua* structural relation), especially in temporal contexts with respect to questions of ‘endurance’: structural integrity – conceptualised as an ontological consequence of the continued possession of form – is understood as carving the edges of an entity’s four-dimensional features.²⁰ On the other hand, citing the form (*qua* structural relation) of an entity is often touted as being explanatory with respect to the particularities of that entity’s *de re* modal profile – especially in the context of the paradigmatic case of coincident objects: the aforementioned ‘structural constraints’ that constitute forms are understood to both permit and proscribe the space of compositional possibilities for the entities in which they’re realised.²¹

The potential explanatory prowess of the ‘principle of unity’ form of contemporary hylomorphism notwithstanding, with the previous section of this paper in mind, the fundamental discontinuity between that form and that of what I understand to be Aristotle’s framework is I hope rather clear: the former’s adoption of a mereological account of *oneness* is entirely incommensurate with the latter’s grounding of substantial unity in the intricacies of the ontological interplay between *potentiality* and *actuality*. Now this discrepancy with what I take to be Aristotle’s framework of course provides no independent justification for its dismissal, but a pertinent question is whether the conception of form *qua* ‘principle’ is able to play the ontological and epistemological role it was principally posited to perform – that is, as the source of substantial unity. My contention is that its attempt to do raises more questions than it answers – questions which Aristotle’s hylomorphic framework is amply more adept at answering.

Consider first the explanatory role which form *qua* ‘principle’ is meant to play: on this conception of form, in what sense is citing the form of an entity explanatory with respect to its unity? If we ask *how* or *why* it is that *this* is a mere ‘heap’ and *this* a genuine ‘substance’, the answer that a certain relation which holds among the latter’s

constituents which specifies its structural features doesn't seem particularly satisfying. *Prima facie*, this sort of answer – irrespective of what sort of structure one appeals to here – doesn't *explain* the latter's unity, but merely *states* the way in which it *is* unified. The claim that, for instance, in appealing to the covalent bond structure of a Hydrogen molecule, one has thereby discharged the explanatory burden of accounting for its supposed substantial unity strikes me as mistaken. In the hylomorphic framework, invoking 'form' is meant to be elucidatory with respect to that unity – but, of course, explanation is one thing, description another. What is it about electron-sharing that qualifies this molecule as ontologically *one*, and the plastic model of that molecule on my desk as *many*? Appeal can of course be made to a number of more specific criteria – e.g. the relatively high measure of 'inseparability' which the former (but not the latter) possesses – but for every such criterion the question remains: *in what way* is *that* constitutive of 'one-ness'? In general, an appeal to 'real definitions' does very little work with respect to *explaining* substantial unity, and whatever work it might do on that front – *via* a further appeal to dissemination difficulty measures, sustained spatial proximity of its parts, etc. – doesn't look to stem from the descriptive machinery of those definitions.²²

The question of in what respect an appeal to the structural features of an entity explain its genuine unity of course does not arise in the context of the Aristotelian hylomorphic framework I've endorsed. However, within that framework, one can certainly answer the question of in what respect the 'form' of an entity is explanatory with respect to substantial unity in, I think, a more principled fashion. For the sake of argument, let us suppose that the H₂O molecule model on my desk could somehow perform the causal role which the H₂O molecule in the glass of water on my desk does – say, 'hydration'. Why does the latter possess substantial unity, while the former does not? According to Aristotle's hylomorphism, the answer is simple: because it is *not* one thing *to be a collection of two hydrogen atoms and one oxygen atom* and another *to be capable of performing a hydration role*, what operates as the 'matter' of the molecule intrinsically and essentially does so – it is *one* with its form. Thus, invoking the 'form' of an entity allows one, on this Aristotelian model, to discern whether the molecule or the model is composed of parts whose capacities are in 'ontological alignment' with it, and thus whether either is a genuinely unified entity.

To return to the form *qua* 'principle' view, what of the ontological virtues which the hylomorphic framework is meant to afford its adherents with respect to substantial unity: the ability to keep Theseus'

ship sailing aside, the invocation of 'form' is purportedly meant to provide a principled division among the denizens of the natural world, one which is able to distinguish the relatively scarce 'substances' from among the overabundant 'sums'. Does the conception of form *qua* structural relation confer the ability to construct this sort of suitably *restrictive* ontological inventory? The aforementioned explanatory deficiency of 'real definitions' paired with the relative paucity of their conceptual content suggests not. For supposing that 'substance-hood' is achievable by an assembly of entities just in case they collectively fall under a single 'principle' which specifies the ways in which they are structurally organised doesn't encourage the prohibitive pruning of one's ontology, but is instead a prescription for proliferation.

It is, after all, trivially easy to define into existence any number of 'real definitions' with just as much conceptual content as any other, widely accepted 'principle of unity', and it's likewise rather difficult to see how this conception of form will be able to effectively rule-out these *nomina* in a non-*ad hoc* fashion. Indeed, on this conception of form, the infinite ontological inflation which accompanies 'mereological universalism' seems entirely unavoidable: if such forms are the metaphysical guarantors of fusion, Lewis' (1991) 'trout-turkeys – entities whose proper parts are the front halves of trout and the back halves of turkeys – will be afforded the same claim to *oneness* which tigers or tables enjoy. Interestingly, although Fine (1999: 73, 2007: 162–165) explicitly accepts, and Johnston (2006: 697–698) doesn't explicitly reject this seemingly anti-hylomorphic implication, it is one the progenitor of that doctrine would have likely disavowed.²³ In *On the Soul*, while evaluating the claim that the soul (read: form) of the body is to be identified with a certain kind of 'harmony' – which he defines as 'the mode of composition of the parts of the body', one that specifies a particular 'ratio' among them – Aristotle states:

It is equally absurd to identify the soul with the ratio of the mixture; for the mixture which makes flesh has a different ratio between the elements from that which makes bone. The consequence of this view will therefore be that distributed throughout the whole body there will be many souls, since every one of the bodily parts is a different mixture of the elements, and the ratio of mixture is in each case a harmony, i.e. a soul. (408a14–18)

The parallel of course isn't precise, but it's not difficult to make a plausible application to the case currently under consideration: mere 'structural relations' are apt to produce forms without end, and the unparsimonious addition of all manner of mereological monsters to

one's ontology is mirrored in the excessive profusion of the 'many souls' with which Aristotle was unwilling to populate the body. Are there ways in which this conception of form might be able to retain some semblance of a restrictive ontology of the sort envisioned in the theoretical aims of hylomorphism? One could, as Koslicki (2008: 171) does, invoke a kind of 'metaphysics first, mereology second' policy: questions of composition – and hence, questions of form – should only be applied to those entities that we're ontologically committed to, either because of their utility in the sciences or as a matter of pre-theoretical plausibility. Given that we don't countenance 'trout-turkeys' as belonging to either of these categories, their ability to be given a 'real definition' *via* the specification of a set of structural relations that holds among their parts doesn't *ipso facto* necessitate their inclusion in one's ontology.²⁴

If this sort of policy is to avoid the charge of being overtly question-begging and amount to something more than the insistence that only *real* entities have 'real definitions', presumably there will be *something* about 'real definitions' which disqualifies disjointed sums from possessing them – but what? Perhaps an appeal to one of the aforementioned explanatory roles of 'form' can be of service here: the only structural relations that qualify as 'real definitions' are those which impose some suitably specific *modal constraints* upon the mereological constituents which satisfy them. However theoretically promising such an appeal may seem, I suspect that putting it into practice will prove problematic: in what respect do the 'structural constraints' imposed by the 'real definition' of, say, the Water molecule – it must be composed of two hydrogen atoms and one oxygen atom, it may have hydrogen atoms on either side, but these must be at an angle of 140° and may not bond to one another, etc. – differ in any principled fashion from those imposed by the 'real definition' of the 'trout-turkey' – e.g. it must be composed of one half of a trout and one half of a turkey, it may have any trout half, but this must be its anterior half, etc.?

Now, while these particular questions do not arise in the context of Aristotle's hylomorphism as I understand it, one might reasonably ask whether that framework can do any better here. I think it can – in fact, it offers a less *ad hoc* 'metaphysics first, mereology second' strategy. Consider the sort of thing proponents of the form *qua* 'principle' conception must say in response to the problem of ontological proliferation: 'I grant that there exists a structural relation <trout, turkey> – and so a 'trout-turkey' form – but I do not grant that it is a *real form*'. The onus is then on these proponents to provide a principled

account of what it is a 'real' structural relation *has* that a gerrymandered one *lacks* which, as I've pointed out above, is a tricky task. However, in what I take to be Aristotle's hylomorphic framework, wherein form is identified with *activity*, there is no corresponding burden, as the worry of ontological proliferation stops at the start. On that framework, one does not have to say 'I grant that there is an activity 'trout-turkeying' – and so a 'trout-turkey' form – but I do not grant that it is a *real* form'. Rather, one can simply deny that there exists any capacity whose actualisation is 'trout-turkeying', and thus deny the existence of the activity 'trout-turkeying', and the existence of a corresponding 'trout-turkey' form, *ab initio* – a move that is plausibly unavailable to the proponents of the conception of form *qua* 'structural relation', given that there are likely no non-*ad hoc* reasons for insisting that 'trout-turkey' doesn't qualify as a structural relation under the standard axioms of second-order logic.

Forms of Form: Powers

This Aristotelian response notwithstanding, there may very well be compelling answers to these questions concerning explanation and ontology that the advocate of the 'principle of unity' conception of form could offer, but the difficulties they pose are certainly not trivial. Attempting to solve these difficulties (outside of the context of Aristotelian hylomorphism, that is) might suggest an obvious way forward, one which will lead us to the next type of hylomorphism prevalent in the contemporary literature. For the central problem from which these various difficulties stem seems to be that the conception of form *qua* structural relation just isn't *robust* enough to perform the function its proponents purport it to. Plausibly, that performance requires the adoption of a more *potent* conception of form, one according to which forms are fully-fledged, discrete, causally efficacious elements within one's ontology. Such a conception may neatly solve both of our above worries: the explanatory prowess of form will be explicable *via* its role in genuinely *causing* the unification of an entity's mereological make-up, and our ontological commitments to the existence of genuine 'substances' will extend only as far as we're afforded sufficient evidence of the effects of this causal control having been enacted.

This second type of hylomorphism then comprises those accounts which conceptualise the 'substantial unity' of hylomorphic compounds

as the proper effect of a *sui generis causal power* actively exerting its regulative impetus upon an entity's constituents to establish their organisational integrity.²⁵ On this type of account, the form of an entity is typically understood as an *emergent* disposition – one that perhaps arises from, but is decidedly not ontologically reducible to that entity's parts – which enacts a kind of *top-down* causal influence upon the configuration of its compositional elements: form, as Jaworski (2016:44) puts it, 'carves out distinctive individuals from the otherwise undifferentiated sea of matter and energy that is or will be described by our best physics'. It's important to note that this is a conception of form which is radically distinct from the one previously considered. As Koons (2018:7) makes clear, on the conception of form *qua* 'power':

Each substantial form is not a complex structure but a simple metaphysical cause of the character of the substance, a formal cause that grounds that very substance's complex structure.

According to this conception then, the compositional configuration of a genuine substance is *not identical* to its form, but is instead *an effect* of the activity of its form.²⁶ One might view this assertion as in alignment with Aristotle's earlier discussed dismissal of form *qua* 'harmony', or 'ratio', and indeed, even the casual reader of his scientific works (e.g. *Physics*, *On the Parts of Animals*, etc.) – where the concept of teleology plays a much more central role – will recognise the importance of the *causal* role of form in his hylomorphic framework. In the *Physics*, for instance, in discussing the organisational features of natural entities, he states that:

Since nature is twofold, the matter and the form, of which the latter is the end, and since all the rest is for the sake of the end, the form must be the cause in the sense of that for the sake of which. (199a30–33)

Aristotle's emphasis on and prioritisation of the dynamic role which form plays in the generation and organisation of the 'material' composition of substances is well-known, and philosophers have long appealed to purported scientific instances of 'downward causation' in their explications of the activity of Aristotelian forms – a practice that continues to this day.²⁷ That the conception of form *qua* power is both ontologically robust and potentially subject to empirical scrutability affords its advocates the opportunity not only to lay claim to the aforementioned theoretical benefits of hylomorphism concerning persistence and modality, but also (as I pointed out above) to more

sufficiently satisfy that doctrine's ontological and epistemological aims with respect to substantial unity.

The potential explanatory prowess of the 'power' form of contemporary hylomorphism notwithstanding, as I detailed in the first section of this paper, its form of 'form' is a far cry from the one which I take to be at centre stage in Aristotle's original framework. It should be easy to see – in light of the discussion of the previous section – that the former adopts a mereological account of *oneness* which is foreign to that Aristotelian account of substantial unity. But perhaps a subtler point to be noted is that the former's use of the distinction between *potentiality* and *actuality* in such an account, while seemingly more closely aligned with how I've explicated Aristotle's use, is in fact radically at odds with it. As I detailed in the first section of this paper, for Aristotle, forms – unlike 'powers' – do not intrinsically change states of being: they do not themselves pass from potentiality to actuality, but *are* a state of being – namely, actuality, or activity. Furthermore, because forms are the actualisation of *potentiality*, the interplay between 'actuality' and 'potentiality' – that is, between form and matter – which I hold is at the heart of Aristotle's account of substantial unity is not a causal one between 'agent' and 'patient'. Just as with the previous form of contemporary hylomorphism, the form *qua* 'powers' account of substantial unity being discordant with Aristotle's framework doesn't straightforwardly ring its death knell. But here again I contend that the account's attempt to play the ontological and epistemological role it is meant to perform (that is, as the source of substantial unity) raises more questions than it answers – questions whose corresponding complications simply have no correlate in the context of my interpretation of Aristotle's hylomorphism.

For note that in order for the theoretical virtues of this form of 'form' to be had, its advocates have to pay a rather costly price – namely, a commitment to the reality of 'downward causation', the instrument by which the 'matter' of an entity is *en-formed* to become *one* (rather than many). Calculating the 'conceptual cost' of this type of hylomorphism is of course contingent on what precisely one takes downward causation to consist in, but I suspect that most – assuming they're able to get a sufficient grip on the concept – will find its fee too steep. As I see it, there are two main routes one can take in attempting to explicate what downward causation might amount to within the hylomorphic framework. The first avenue, perhaps the one most identifiably Aristotelian, amounts to treating 'formal causation' (that is, causation by means of a form) as its own *species* of causation. As perhaps the progenitor of the

thesis known today as ‘causal pluralism’, Aristotle was careful to distinguish ‘formal causes’ as unique: unlike mere ‘efficient causes’, whose operation amounts to (as we now might put it) the push and pull of various fundamental forces among matter, explaining the ‘why’ of some things requires an appeal to teleological, or goal-oriented factors: the formation of a young turtle’s shell proceeds in these ways (with the production of these constitutive elements) and is directed toward this shape (with this sort of structural configuration) *because* of the ontogenetic impetus of its essence (and *for* the protection of its adult body).²⁸

While it’s not difficult to appeal to such factors in a wide variety of explanations of both artefactual and natural events, the same cannot be said for the task of comfortably situating this *sui generis* sort of causation in one’s metaphysics. For, as Howard Robinson (2014) has recently pointed out, even if one could suitably explicate what a non-efficient form of causal influence might look like – by what means it *operates*, how it can be *detected*, etc. – the onus would presumably remain on one to identify the way in which its dynamics don’t directly violate the causal closure of physical systems (under efficient causation). It is of course open for the defender of this novel form of causation to claim that this demand is an unfairly question-begging one, but as it is certainly not one raised in a vacuum – given that our scientific understanding of the natural world has thus far proceeded under the as yet unrefuted assumption that this sort of closure holds – a failure to sufficiently satisfy it, or a deliberate dismissal of its importance by those defenders must be met with some amount of scepticism. In short, if endorsing this form of hylomorphism comes at the cost of accepting the existence of a novel *species* of causation, one might reasonably wonder whether the rate is worth the return.

Those who have wished to avoid exactly these sorts of worries typically traverse the alternative available avenue with respect to explicating the nature of downward causation in the hylomorphic framework wherein formal causation is conceptualised as consisting in an entity’s irreducibly *holistic*, ‘system-level’ control over its constituents and their configuration. Examples from the biological sciences are often used for illustrative purposes: the causal activities constitutive of regulative phenomena – those exhibited in the homeostatic robustness of developmental mechanisms, or in the adaptable ordinances of metabolic and immunological processes – are plausibly instances of, as Deacon (2006:130) puts it, ‘the interaction dynamics at lower levels [being] strongly affected by regularities emerging at higher levels of

organisation'. On this view, where causal phenomena whose explanation appears to invoke the irreducibly novel and holistic 'downward' activity of an entity on the distribution and development of its constituents, formal causation is afoot.

Whatever advantages this avenue possesses over the other, it is not without its own budgetary concerns for, as hinted at above, adopting this conception of formal causation appears to come at the cost of making (at least) a couple of rather questionable assumptions. Those who endorse this conception typically argue for its plausibility by noting that positing the existence of holistic, system-level causal powers affords one with *irreducibly novel* explanatory resources with which to understand the integrative operations of an entity's compositional elements: the higher-order dynamical models utilised in systems biology, for instance, are often taken to furnish explanations of organism-wide phenomena that are necessarily distinct from, and cannot in principle be analytically derived from those licenced by lower-level, mereologically complex mechanism-based models.²⁹ But does explanatory novelty, or explanatory irreducibility entail ontological novelty? That is, if one affirms that an appeal to higher-level aspects of entities endows one with truly novel explanatory prowess, one that is seemingly underivable from the aggregated activities of their constituents, must one also affirm that entities amenable to such analyses are ontologically 'more than the sum of their parts'? As the assumption that this entailment is sound is, at the very best, highly controversial, having to accept it as such in order to get this conception of formal causation off the ground undoubtedly raises the price at which this type of hylomorphism must be purchased.³⁰

No matter which approach to downward causation one might adopt in order to explicate the activity of forms *qua* 'powers', conceptual difficulties abound. And while there may be addendums to these accounts which attempt to dispel such difficulties, it should be noted that Aristotle's hylomorphic framework – as I have interpreted it – is not faced with the daunting prospect of mounting this defence. For in that framework, as I have reemphasised in this section, 'forms' are not powers whose activities causally unify an entity's constituents: they are neither capable of 'manifesting' – as they do not pass from potentiality to actuality, but *are* actuality – nor of causally affecting matter – as they do not act *upon* matter, but are the activity of matter.³¹ Thus, in Aristotle's framework, the question concerning how it is that the form of an entity *qua* a power which arises from and subsequently operates on its matter is capable of causally unifying its constituents

simply does not arise – and accordingly, neither do the ostensibly intractable complications which accompany the concept of ‘downward causation’.

Coda: An Aristotelian Diagnosis

As illustrated throughout the previous sections, both the ‘principle’ and ‘power’ forms of contemporary hylomorphism engender various conceptual difficulties: the former is open to the charge of explanatory deficiency and unwanted ontological proliferation, while the latter requires the adoption of novel, or at least non-standard conceptions of causality.³² Perhaps one of these types of hylomorphism possess other theoretical virtues which ultimately outweigh these vices – it’s certainly possible, though that is of course a case for their respective advocates to make. In this section, rather than examining the merits of these sorts of cases, I want to take a step back and offer an analysis of these two types of hylomorphism from a (semi-exegetical) Aristotelian perspective. In what follows I provide a diagnosis of their respective difficulties, and my claim is that their origin lies in the fact that both types of hylomorphism suffer from a kind of complementary deficiency: what one (correctly) emphasises, the other (incorrectly) overlooks. As a result, from the perspective of what I take to be Aristotle’s original doctrine, each only tells half the hylomorphic story.

To see this one need only note that there are, perhaps fittingly, two aspects of Aristotle’s hylomorphism – the *conceptual* and the *concrete*: for it is a doctrine *derived from* particular empirical observations about the workings of the natural world *codified in* particular theoretical commitments and constraints. These two aspects of the doctrine are equally important, and the problems that plague either form of contemporary hylomorphism can I think be traced back to their respective failures to sufficiently treat them as such. This fundamental imbalance is perhaps most apparent in the ‘principle’ form of hylomorphism, as it is one which I think most interpretations of Aristotle’s hylomorphism, both historical and modern, clearly share – one which stems from adopting a notion of form that is derived from an overemphasis on the conceptual framework of hylomorphism presented in the *Metaphysics*. The origin of this myopic focus isn’t difficult to discern, as it is in the *Metaphysics* alone – especially in Z and H – where one finds comprehensively detailed discussions of ‘matter’, ‘form’, ‘substance’, and the relations

among them. When one surveys the entirety of the Aristotelian corpus for insight on the doctrine of hylomorphism however, it's clear that something is (largely) missing from the *Metaphysics*: the *dynamic* character of form.³³

Any reader even only mildly acquainted with the *Metaphysics* will likely be familiar with the paragons of hylomorphic compounds it most frequently makes appeal to – statues, spheres, and houses. Aside from occasional exceptions, the discussion of these exemplars in the *Metaphysics* variously characterise 'form' as a rather *abstract*, ontologically ethereal feature: the form of an entity is identified with a certain 'arrangement', a definitional 'formula', or simply a geometrical shape or 'figure'. One thing that all of these characterisations have in common though is their depiction of 'form' as an essentially *static* feature – for whatever role arrangements, formulae, and figures might play in the individuation of entities, it certainly isn't a *causal* one. In the realm of spheres and statues, the depiction of form as fundamentally inert may seem only natural – but from the more comprehensive perspective of the wider Aristotelian corpus on the workings of the natural world it is, as I have explicated in the first section of this paper, a misleading one. For the characterisation of form in the *Physics*, for instance, such inactivity is anathema – there we are told (many times over, and in great detail) that form is a 'principle of motion' and an 'innate impulse to change'.³⁴ Likewise, in the works where organisms are principally in view, form is characterised as being the very 'cause of being' of a living thing whose performance of a particular *function* ensures that, for instance, 'man has such and such parts [...] [and that] the process of his development is necessarily as it is'.³⁵

Why is there such disparity among the depictions of form within the Aristotelian corpus? I follow Kosman (2013: 92–93) in thinking that the reason is in fact a rather simple one: the most basic conceptual framework of hylomorphism – the 'dual nature' of substances – is most easily motivated and illustrated *via* analogy in examples involving artefacts: showing that one can distinguish between the 'clay' and the 'shape' of a statue and by so doing subsequently discern certain interesting conceptual relations which hold between them (of ontological dependence, explanatory priority, etc.) is a task immeasurably less difficult than demonstrating that giving a sufficient analysis of the conceptual interplay between 'causation', 'necessity', and 'function' in the context of organismal development is a 'dual nature' job.³⁶ Armed only with the *Metaphysics*, one could certainly be forgiven for thinking that Aristotle countenanced spheres and statues as substances

par excellence. But in light of the hylomorphic doctrine as it is explicated throughout his work, it's clear that for Aristotle (as illustrated in the first section of this paper) such artefacts, though excellent heuristic devices for pedagogical purposes, possess only an *accidental*, and thus *insubstantial* unity.³⁷

As it is derived from (or is at the very least largely inspired by) the hylomorphic compounds prevalent in the *Metaphysics*, the concept of form *qua* 'structural relation' that typifies contemporary hylomorphisms of the 'principle' variety is likewise dynamically deficient: a state of affairs which, as evinced in a previous section of this paper, rather inevitably leads to the problems of ontological proliferation and explanatory insufficiency. In recognising the important role that the aforementioned more 'concrete' discussions of hylomorphism in the Aristotelian corpus play in (as it were) substantially informing the broadly 'conceptual' account of the *Metaphysics*, the 'power' brand of contemporary hylomorphism is subject to no such worries.³⁸ Accounts which belong to this brand, in stark contrast to those of the 'principle' sort, place both the *active* and *teleological* character of form front and centre. As suggested above, this emphasis is, from the perspective of Aristotle's work on the natural world, entirely appropriate: the hylomorphic analyses of organisms therein crucially rely upon the explicitly dynamical concepts of *ergon*, *energeia*, and *entelecheia*. That said, however elucidatory the more 'concrete' works are with respect to the role of form, they too are in a way incomplete: for noticeably lacking in that corpus is any discussion or application of the conceptual framework of hylomorphism as explicated in the *Metaphysics* – the principles and parameters of the doctrine that are the focus of the latter are simply not in the former's view.

Whatever the reason for this, it's clear that interpretations of hylomorphism drawn primarily from that corpus must be carefully evaluated with a contextually wider level of discernment to ensure that those principles aren't dismissed or otherwise infringed therein. When subject to such scrutiny, contemporary hylomorphisms in which forms are conceptualised as 'causal powers' don't fare very well, as they typically fall afoul of one of the primary restrictions placed on substantial unity in the *Metaphysics*: the non-compositionality of the form-matter relation, and the accompanying unmereological nature of form.³⁹ As unambiguously illustrated in the famous 'syllable argument' of *Metaphysics* Z (1041b11–33), if the form of an entity is to secure its genuine substantial unity, it cannot be an 'extra' ontological element

which exists in addition to and operates alongside of those which comprise that entity's matter.⁴⁰ In short, according to the conceptual strictures of the *Metaphysics*, forms are neither *things* (broadly conceived), nor *parts of things*.⁴¹ It's easy to see that contemporary principle-based hylomorphisms typically satisfy this constraint – when they are not explicitly reified (something not entirely unheard of in contemporary metaphysics), 'structural relations' are generally understood as being unmereological. On the other hand, those hylomorphisms which purport to secure substantial unity by means of the existence and operation of an emergent, or otherwise ontologically irreducible causal power among and upon an entity's mereological constituents are plausibly prohibited by this Aristotelian principle: insofar as such a form is an 'addition of being', it will plausibly itself require mereological unification with its corresponding 'matter' in the same way that the various constituents which make-up that matter themselves do with one another.

As I hope by now is clear, from the perspective of what I take to be Aristotle's original doctrine, both forms of contemporary hylomorphism suffer from a kind of complementary deficiency – what one *has*, the other *needs*. Without the *dynamism* of the 'power' accounts, forms *qua* 'principles' are typically far too ephemeral to be effectual, and without the *non-compositionality* of the 'principle' accounts, forms *qua* 'powers' are typically so tangible as to themselves stand in need of mereological tethering.⁴² In both of these cases, in other words, there tends to be an imbalance between the concrete and the conceptual (as earlier described). Interestingly although as far as I'm aware this imbalance has yet to be explicitly discussed in the literature, its need to be addressed is at least implicitly evident in the fact that exemplars from both types of contemporary hylomorphism have attempted in various ways to incorporate the respective merits of the other type.

In recognising that the *static* nature of form typically presented in principle-based hylomorphisms is either incomplete, or else is lacking in explanatory prowess, advocates of those sorts of accounts have attempted to explicate ways in which 'structural relations' can themselves be suitably *dynamic* – thus Fine's (1999) 'variable embodiments', Johnston's (2006) 'multi-track structure', and Koslicki's (2008) 'formal recipes'.⁴³ These concepts of course differ in their details, but in essence, in each of them certain sorts of structural relations are said to be dynamic in virtue of the fact that, because they only require that certain *kinds* of entities function as their relata, they intrinsically allow for it being the case that *which particular* entities (of that kind) are thus related

is a state of affairs that may – and even perhaps often does – change over time. Of course, one might wonder whether a structural relation allowing the possibility of ‘relata swapping’ is enough to qualify *the relation itself* as dynamic: the actual exchanging of entities which function as relata in the relation ‘being 30 meters from Turl Street’, for example, is certainly a sort of dynamic affair, but that doesn’t seem in any straightforward sense to render the relation as such. Indeed, the essentially *static* nature of these relations seems presupposed by the implicit assumption that such instances of ‘relata swapping’ *aren’t* tantamount to the obtaining of *novel* relations, but are instead exhibitions of the purported dynamism of a *single, unchanging* one.

As the genuinely dynamic nature of the forms prevalent in power-based hylomorphisms play such a robust causal role in securing substantial unity, many of its advocates have recognised their potential to become ontologically unwieldy. Most often, these powers are reigned in, as it were, by conceptualising their activity *via* the second option outlined in the previous section – that is, as a kind of *holistic causation*. This is a natural and *prima facie* attractive move: if forms are essentially causal powers of *substances* – ones whose operations somehow arise from, or are otherwise grounded in an entity’s collection of parts – they plausibly constitute less of a ‘substantial’, approximately mereological addition to those parts (and hence are less subject to the unification worries mentioned above). Thus Koons (2018: 7; 2014: 159–168) emphasises that the form is a ‘simple metaphysical cause’, which he describes as a ‘primary power of the whole’ or ‘formal process’ in which an entity’s material components participate that produces a genuinely unified substance. Likewise, Jaworski (2016: 136) characterises the form of an entity as a ‘configuring activity [which] unites into one the diverse materials that compose the whole’, broadly echoing the sentiments of Rea (2011: 349) that such activity is fundamentally only a kind of ‘cooperative manifestation’ of an entity’s parts. However, adopting this sort of suitably ‘thin’, ontologically non-additive characterisation of forms *qua* holistic powers, activities, or processes comes at the cost of calling into question the *modus operandi* of the rather robust role they are meant to play in causally establishing substantial unity: supposing that an entity cannot act, or operate ‘as a whole’ *before* its parts have been properly unified, in what sense can a holistic power or process be *itself* causally responsible for the unification of an entity’s parts *into a whole*?⁴⁴

In short, both attempts by either type of contemporary hylomorphism to attain the integration of *dynamism* and *non-compositionality* at the core of Aristotle’s concept of form engender conceptual difficulties and

theoretical complications which, once again, simply have no correlate in the context of what I take to be Aristotle's original hylomorphic framework. With the first section of this paper in mind, I contend that the *imbalance* which inherently plagues both types of contemporary hylomorphism arises from their shared ignorance of the *source* of this balance in Aristotle's framework – the conception of form *qua* actuality, or activity. For according to my interpretation of Aristotle's hylomorphism, forms are (a) the very instantiation of dynamism itself, but not in virtue of their being ontologically independent causal agents which act upon an entity's parts, and are (b) compositionally non-complex, but not in virtue of their being mere relations among an entity's parts. In light of the full discussion of this paper it's my estimation that, no matter how many epicycles are added by either type of contemporary hylomorphism in an attempt to achieve the balance of Aristotle's hylomorphism, without that framework's unique emphasis on the ontological interplay between *potentiality* and *actuality* as the ground of substantial unity, it will remain a goal which continually eludes them.

Conclusion

Much more could of course be said both about the unique account of substantial unity which I take to be at the heart of Aristotle's hylomorphism and about the intricacies of the conceptual frameworks of its contemporary correlates, but I hope this necessarily abbreviated overview has at least in some small measure begun to highlight the varied ways in which the latter fundamentally diverge from the former. At first glance, the hylomorphic insight that a proper analysis of substantial unity requires conceptualising *dynamic powers* as *principles of unity* appears to have contemporary cognates but, as I have shown, these are little more than 'false friends'. This is because, in short, the unity of genuine substances according to Aristotle's doctrine, as I understand it, has nothing whatsoever to do with the compositional-*cum*-structural integrity of entities being dependent upon the downwardly directed activities of their powers, and everything to do with the powers of which they are composed being *essentially directed toward the operation of particular activities* and *depending for their very existence upon their engagement in those activities*. While the conceptual intricacies of this interpretation of Aristotle's hylomorphic apparatus might by today's standards seem overly scholastic, as employing them does not engender the problems that plague

contemporary forms of that doctrine, and as they constitute a unique analysis of 'functional unity' that remains largely unexplored in contemporary metaphysics, it's safe to say that in such subtleties there may yet be something of substance.

Notes

1. See for instance the papers collected in the following volumes: Tahko (2011), Groff and Greco (2013), Novotny and Novak (2014), and Simpson, Koons, and Teh (2017).
2. So named in van Inwagen's (1990) influential mereological treatise.
3. Though it is not often present in contemporary discussions, this is no novel interpretation of hylomorphism – see Bos (2003), Makin (2006), Johansen (2012), Kosman (2013), and Shields (2017). Although in what follows I treat this interpretation as 'Aristotle's View', I am of course taking an opinionated stance on the issue and do not mean to imply either that it is the only or even that it is the favoured exegetical analysis of Aristotelian hylomorphism present in the literature.
4. Amongst a discussion of circles and right angles, there is a brief mention of this in *Metaphysics* Z 1035b14–16, where Aristotle points out that: 'the soul or life of animals is their primary being; that is, it is their form and what it is to be a body of this kind'.
5. *Metaphysics* H 1043a16–18; *On the Soul* 412b18–20.
6. This identification is in fact explicitly stated at the very end of *Metaphysics* H 1045a23–40: 'there is a material and a form, and the material is a power (potentiality), whereas the form is operation (actuality)'. On the importance of the principles of *Metaphysics* Θ to hylomorphism generally, see Makin (2006), Beere (2009), Johansen (2012), and Kosman (2013).
7. Thus Aristotle's insistence that the matter of substances is to be identified with 'a natural body which has organs' (*On the Soul* 412a28), the Greek word 'ὄργανον' specifying a tool or instrument which has the capacity for the performance of a particular *ergon*, or functional activity. See Shields (2017) for an excellent discussion on Aristotle's view of matter as intrinsically 'teleonomic'.
8. For expressions of that principle, see *Metaphysics* 1035b10–26, *On the Parts of Animals* 640b34–641a34, *On the Soul* 412b12–13; 412b21–23, *On the Generation of Animals* 734b24–27, and *On Generation and Corruption* 321b29–32. Aristotle's radical view here – denying what Frey (2007: 169) calls the 'two-body hypothesis' – might be temporarily identified with a position in the debate about the definition of 'life' that Olson (2013) calls 'corpse eliminativism'. The importance of this principle to Aristotle's hylomorphism is discussed in more detail below.
9. These organisational activities – functional integration and homeostatic/ autopoietic maintenance – are what Aristotle refers to, in *On the Soul* 412a18–b9, as the 'first actuality' of an organism's body, or matter, and are of course foundational to the exercise of its activity *qua* an organism of its kind, its *bios*. See Lennox (2017) for a concise discussion on the conceptual interplay between form, function, and *bios*.
10. The unique nature of Aristotelian powers and the various ways in which they fundamentally differ from those utilised in contemporary metaphysics has recently been discussed in detail by Marmodoro (2018).

11. Aristotle's emphasis on the importance of the 'inseparability' of matter and form (especially as explicated in *Metaphysics* Z 10–11) has led some interpreters to hold that, contrary to his repeated insistence elsewhere, Aristotle believed that the *definitions* of genuine substances must be grounded in both their form *and* matter; see Charles (2009) for a notable expression of this view. For a detailed discussion of the various conceptual nuances surrounding the debate on the so-called 'purity' of form, see Devereux (2011) and Wedin (2000: §7).
12. In his discussion of the nature of Aristotelian artefacts Frey (2007: 200) nicely summarises these two points using the example of a wooden bed: 'The wood [...] is identifiable independently of its being the wood of a bed, and is not necessarily the wood of a bed'.
13. I note here – as will be made clear in the following sections – that endorsing these modalities entails an explicit rejection of contemporary hylomorphisms' conception of the 'dynamism' of form. For Aristotle, the forms of genuine substances cannot be merely 'formal recipes' (Koslicki 2008, 2018a) or 'multi-track structures' (Johnston 2006) which are capable of having 'variable embodiments' (Fine 1999). In other words they, unlike their artefact analogues, are not what we would nowadays refer to as *multiply realisable*; see footnote 15 for further details.
14. For more on this interpretation of the notion of inseparability as it applies to hylomorphic compounds, see Ferejohn (1994), Woods (1994), Lennox (2008), and Kosman (2013).
15. Although it by far represents the minority reading in Aristotelian scholarship, it should be noted that there are those who, in recognising the nature of form *qua functional activity*, interpret Aristotle as a (modern-day) 'functionalist' *tout court*, and thus view both artefactual or organismal forms as being 'separable' in the relevant sense – see Nussbaum and Putnam (1992), and especially Shields (1991, 1993). For relevant discussions on the 'compositional plasticity' of form, see Koslicki (1997), Wedin (2000), and Woods (1994).
16. All of these applications are present in Simpson, Koons, and Teh (2017); cf. the remaining references in footnote 1.
17. I note here in passing that the bipartite division proposed in the following typology of contemporary hylomorphisms is not without precedent. Indeed, as Pasnau (2004) has clearly and carefully illustrated, it is the product of a long and storied dialectic in the history of philosophy among interpreters of Aristotle throughout the medieval and early modern periods.
18. What follows is an admittedly rather 'bare bones' explication of the 'form *qua principle*' type of hylomorphism, of which there are a myriad of philosophical intricacies and epicycles one could explore at some length. But as the aim of this paper is to raise quite general concerns about the approach of this (and the next) form of hylomorphism, I leave investigating the matter more in depth to the discretion of the reader. For exemplars of this type of hylomorphism, see Fine (1999), Johnston (2006), Koslicki (2008), and Toner (2013).
19. See the references in the previous footnote for examples.
20. For hylomorphic principles being utilised in an account of 'endurance', see Toner (2013), and Inman (2014).
21. For the application of a hylomorphic framework to puzzles about coincident objects, see Fine (2008) and Koslicki (2018b).
22. One could of course question whether, if 'structural relations' like 'bonding' can do the job, we really need 'hylomorphism' (and all the associated metaphysical baggage it brings) to account for substantial unity. Considering this meta-theoretical issue is however outside of the scope of this paper.

23. Koslicki (2008: 83–85) discusses this implication under the heading of ‘superabundance’, presenting it as a problem for Fine’s view which her own allegedly avoids – though I confess that I’m unable to see how it might. In her latest work, Koslicki (2018a) abandons the idea that ‘structure’ *alone* is responsible for substantial unity, appealing instead to non-structural read: non-‘formal’) factors in an attempt to rule out a superabundant ontology. There she advances an account wherein *genuine* hylomorphic unification requires that the matter of entity be composed of parts whose powers work together in a co-operative fashion to perform certain ‘holistic’ activities; I discuss views of this sort in the final section of this paper in relation to ‘power’-based hylomorphic accounts.
24. It should be noted that this sort of policy, while fairly sensible, is not entirely uncontroversial, and that tried and true metaphysicians might reasonably reject the notion that qualifying for substance-hood *via* hylomorphic composition is a matter ultimately under the auspices of the empirical sciences (or worse, those of pre-theoretical ‘common sense’).
25. As before, the explication of this second type of hylomorphism is of course not exhaustive. As its advocates tend to adopt quite divergent accounts of ‘causal powers’, ‘emergence’, ‘top-down causation’, etc., I have had to keep the description of the ‘form *qua* power’ position rather general. More detail can of course be found in the work of the exemplars of this type of hylomorphism – see, for instance, Rea (2011), Jaworski (2016), and Koons (2017, 2018).
26. I note here that although his hylomorphism is of the ‘power’ variety, Jaworski (2012, 2016) employs an idiosyncratic use of ‘structure’ according to which it is itself a causal power responsible for the unity of an entity’s composition.
27. See for instance Moreno and Umerez (2000), El-Hani and Pereira (2000), Deacon (2006), Tabaczek (2013), and Paoletti and Orilia (2017).
28. On causal pluralism, see *Physics* II.3 and *Metaphysics* Δ , and on explicitly teleological causes in the natural world, see *Physics* II.8–9 and *On the Parts of Animals* I.1.
29. See, for instance, Brigandt, Green, and O’Malley (2017).
30. I discuss this validity of this entailment in Austin (2016).
31. This fact also highlights another important, related one: Aristotelian forms aren’t goal-directed because they impose a goal upon matter (as the power-brand of contemporary hylomorphisms have it), but because they represent the goal, or end-state of matter *qua* a capacity *for* that operative function. See Johansen (2012) for a recent discussion of this point.
32. Although this paper is not the first to raise these problems, they are collected and discussed here for a novel purpose – namely, to illustrate how these sort of worries arise from an unbalanced view of Aristotle’s original hylomorphism, as discussed in this section.
33. Excepting, of course, the somewhat circuitous association of ‘form’ with ‘activity’ and ‘operation’ discussed in the later parts of H, and the associated treatment in Θ .
34. The attentive reader of the *Physics* will note that, even there (especially in Book II), Aristotle sometimes refers to the form of an entity as its ‘shape’, or ‘figure’. Aside from the fact that this association is introduced by the qualifying statement ‘the shape of things which have in themselves a principle of motion’ (193b2-5), a careful reading reveals that it always occurs in the context of the conception of form *qua* ‘nature’, which Aristotle explicitly describes as being ‘a cause that acts for a purpose (199b32).
35. *On the Soul* 415b10; *On the Parts of Animals* 640a33–b4.

36. As Kosman (Ibid. pp. 92–93) rightly points out, there is a more fundamental reason why artefacts serve as particularly good illustrative aids – as they are *not* genuine substances, their ‘matter’ and ‘form’ are truly separable, and are thus easily discussed and examined independently of one another. The separability, and hence non-substantiality of artefacts is discussed in detail in the first section of this paper.
37. Koons (2014: 153) aptly calls the error of interpreting hylomorphism through the lens of artefact examples the ‘statue fallacy’.
38. As most notably highlighted by Furth (1988), the biological works in particular are well-suited to perform this role. For more recent indications of this, see the discussions of Connell (2001) and Lennox (2017).
39. Marmodoro (2013) has notably highlighted this worry in her critique of contemporary hylomorphisms.
40. Aristotle grounds this restriction on the claim that its violation will generate a (presumably infinite) regress, but even if one were to reject that implication, it’s easy to see that accounts of substantial unity which contravene it are likely to lack sufficient explanatory power: if an entity’s collection of parts being properly unified calls out for an explanation, much more so does the posit that a further ‘unifying part’ is able to provide it. Koslicki’s (2008) brand of hylomorphism (which is of the ‘principle’ variety) confronts these worries head-on in an interesting attempt to dismiss the threat of regress *via* conceptualising forms as ‘non-mereological components’.
41. Interestingly, as Scaltsas (2001: 113) points out, the ‘syllable argument’ also somewhat incidentally rules out the eligibility of ‘structural relations’ to function as form. In that argument, Aristotle refers to whatever it is that must be ‘over and above’ an entity’s mereological elements as *substance* – but, as is abundantly evident from elsewhere in the Aristotelian corpus (especially the *Categories* and *Metaphysics* N), ‘relations’ and ‘substances’ belong to very distinct, non-overlapping ontological categories.
42. I employ the qualifier ‘typically’ here purposefully, as I don’t mean to imply that either of these types of accounts are *necessarily* deficient in these respects. My characterisation of them in what follows should thus be understood as describing the general tendencies that accounts of these types in the current literature exhibit with respect to ‘dynamism’ and ‘non-compositionality’. Whether one could successfully develop a ‘principle’ account wherein structural relations are causally robust – as Jaworski’s (2012, 2016) attempts to do, as mentioned in footnote 26 – or a ‘power’ account in which causal powers are more or less mereological ‘free lunches’ – as described in the attempts which appeal to ‘holistic activities’ below – is another matter. I thank an anonymous reviewer for highlighting the importance of this point.
43. As mentioned in a previous footnote, Koslicki’s (2018a: 7) latest view is that structural relations are not solely responsible for substantial unity, partly for the same reasons I outline here: ‘I have come to believe that a proper account of unity requires not only the *static* notion of structure, but also a *dynamic* apparatus suitable to capturing the complex network of interactional dependencies which exist between the proper parts of an integrated whole and the whole itself’ (my emphasis). I discuss the implementation of ‘holistic’ dynamic factors in an account of hylomorphic unity below.
44. In his critique of Jaworski’s hylomorphism, Koons (2018: 7) states that in order to avoid this difficulty, ‘forms must be ontologically prior to wholes’. This sort of affirmation however is apt to lead back to the worries raised earlier in connection with the ‘syllable argument’.

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