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Composition in change:
A hylemorphic view

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Abstract

The problem of how something could persist through change lead Aristotle to formulate his theory of hylemorphic composition, whereby every material thing is composed of the irreducible principles of matter and form. This work aims to affirm Aristotle's position by considering the reality of change, the necessity of a bearer of change and finally, the individuation of bearers of change.

Hylemorphic composition, being a metaphysical theory, touches upon many areas of philosophical enquiry. One area is the mind-body problem. In tandem with developing Aristotle's theory, the suitability of hylemorphic composition as a response to the mind-body problem is presented. The secondary aim of this work is to show that hylemoprhic composition offers a credible response.

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1 Introduction

1.1 The mind-body problem

The breadth of the natural world comes to a head in philosophy when the question of where man fits into the metaphysical scheme is raised. Is the mind the brain or is it something of a radically different nature? For Aristotle, the mind is able to form concepts, which are necessarily abstract, and so have no dependence on matter, implying a radical difference. (DA III.4) Furthermore, this position is not merely historic, but is reaffirmed in contemporary work (e.g. Oderberg 2007: 250–55). If there is such a radical difference, it is difficult to see how mind and brain interact without violating laws of physics, especially those concerning the conservation of energy and momentum. There is, then, a tension between what is known about the world through the empirical sciences and what is known through one's first person experience of the world. This problem is what philosophers call the 'mind-body problem', and it is roughly the problem of explaining the relationship between mental and physical phenomena. It is difficult to give a more precise statement of the problem that is not biased towards one or another theory of mind.

> For instance, to characterise it as the problem of explaining how immaterial mental substances can interact with the body seems to presuppose the truth of dualism; while to characterise it as the problem of explaining how mental processes are produced by physical processes in the brain seems to assume the truth of materialism. (Feser 2006: 250)

The problem does not hinge on whether or not there is some aspect of mental activity which correlates with neural activity. There may well be a neural correlate for every aspect of the mind; that is a topic of research for neuroscience. (cf. Kim 1966) The philosophical question, instead, is whether or not mental processes can plausibly be said to be either identical with neural processes or metaphysically supervenient upon them.[1] However close the causal correlations between the mind and neural activity, such correlations, by themselves, cannot establish identity or supervenience.

Responses to the problem can be divided into those that are characteristically monist and those that are characteristically dualist. Positions of the former kind imply that there is only one irreducible principle and any further phenomena derive from this, whereas positions of the latter kind imply that there are two interacting but irreducible principles.

[1] One thing supervenes on another when there could not be a difference in the first without there being a corresponding difference in the second. (Haugeland 1982)

Arguably the most common monist position is physicalism. This is usually understood as the view that there is nothing over and above physical things — there exists nothing more than the things described by physics. (Papineau 2001) The main argument for physicalism is that the laws of physics rule out the possibility of physical things interacting with nonphysical things. Even if other kinds of principles were to exist, such as the *res cogitans* of Descartes, there would be no way to account for the causal interaction between the two without forfeiting the universality of physical laws. A consequence, however, of upholding the universality of physical laws is a severe constriction on the means by which we may to account for the distinctive characteristics of the mind, for which physics offers little explanatory value.

In seeking to correct the lack of appeal of physicalism with respect to accounting for characteristically mind-related capacities, panspychism shifts the emphasis on what matter really is. Physicalism tends to say that matter is that which physics examines. Anything that falls under the methodology of physics is the raw material, or the principle, of physicalism. However, panspychism argues that the mind-body problem arises out of a misunderstanding of matter, and that there is no problem once we fix our understanding of matter, hitherto construed in a too narrow way, as being purely quantitative. Rather, for the panspychist, when matter is viewed as both that which makes up the brain and nervous system and that which makes up sticks and stones, one can argue that consciousness is, to some degree, a real possibility of matter as such, a *quality* of matter, something in addition to its quantity. (cf. Goff 2019; Chalmers 2016; Strawson 2006)

For these first two monist views matter is the focus, and the mind is something to be accounted for through it. A third view is property dualism which, despite its name, also shall be categorised here as a monist position. This position appears to sit somewhere between physicalism and panspychism. It, like panspychism, rejects physicalism for its failure to account for all of the evidence related to the human condition. That there is 'nothing over and above' physical state appears to have no way of accounting for the aspects of a conscious experience accessible only from the first person point of view. (cf. Nagel 1974; Levine 1983; Jackson 1982; Chalmers 1996) However, it rejects panspychism for not recognising there is something distinctive of animate organisms, rather than universal to all matter, about the properties of the mind.

> Mind and matter are equally fundamental aspects of reality, neither reducible to the other, [...] but there is one one kind of substance, namely physical substance. [Property dualism] holds that physical substance nevertheless has two fundamental kinds of property, namely, physical properties and mental properties. (Feser 2006: 244)

Two characteristically dualist positions are hylemorphic composition and substance dualism. The first of these two positions is not one specifically constructed to respond to the mind-body problem but rather is first of all an account of all materially existing things. According to this view, all material things are individual things of some kind,

and matter is the principle of individuation while form is the principle of being something particular. (cf. Oderberg 2005; Feser 2014) For the hylemorphist, the mind is not a principle but is *present in* the form of the human person, and the body is matter marked by quantity, and coordinated and unified by the form. These two irreducible principles must, for all material things, be united for either to exist. Hylemorphic composition is the position which this work will focus on, attempting to provide an adequate argument for its credibility.

Moving towards greater independence of principles is substance dualism. This theory says that there are two fundamental kinds of substance, namely mental and physical substance, where a distinctive characteristic of the position, as commonly understood, is that it maintains that minds can exist in the absence of bodies and vice versa. Defining significant differences between some interpretations of substance dualism and hylemorphic composition, however, can be far from straightforward, since even existential interdependence of principles has been affirmed in the context of substance dualism. (Lowe 2006)

1.2 Composition in change

The question of the nature of man is urgent, but the manner in which it is generally approached in contemporary philosophy, I suggest, is 'too close to the eye of the storm' when not already equipped with sure ontological foundations. An example of the confusion caused due to a lack metaphysics grounded independently of the mind-body problem can be seen in Searle (2002). He seeks to clarify his position as someone who does not accept to property dualism, but despite this, Feser (2004) argues convincingly that Searle has only further emphasised his position as a property dualist. In order to establish the requisite ontological foundations, this work proposes to reconsider an old starting point that seems to have fallen out of fashion, the phenomenon of change. It is a starting point that should put sufficient distance between the enquirer and the phenomenon such that a reasonably secure metaphysics can be laid out, one which could provide the groundwork for more specialised questions, such as the mind-body problem. (cf. Mortensen 2016; Hawley 2018; Feser 2017: 17-68)

Turning a statement from Aquinas (ST I.9.1) into a question captures the essence of this work: is it the case that 'in everything which is moved, there is some kind of composition to be found'? Though the question may seem a long way off from something as particular as the mind-body problem, there is an obvious connection. For, if change necessarily involves composition, it will follow that there exists more than one fundamental principle. This multiplicity of principles might then provide the general basis for mind and body. Aquinas treats movement as a robust experiential premise and concludes that composition is found in change, specifically hylemorphic composition in the case of material beings, including man. (ST I.76.1) In order to establish the credibility of Aquinas's claim, it will be necessary to engage in three broad areas of enquiry: is change ontologically real; does change presuppose a bearer of change; is a material bearer of

change hylemorphic?

1.2.1 Is change ontologically real?

That some things change seems like a common-sense truth about reality that is in no need of questioning. Yet, on the outcome of its analysis rests the core of Aristotle's metaphysics, namely that composition of potency and act encompasses all of reality, and furthermore, the composition of matter and form, as a specific case of potency and act, encompasses all material reality. Aristotle's hylemorphic composition has very little acceptance in contemporary academic philosophy. This may be because of the weakness of the premise that change really exists or the premise that any change is caused by something already actual, or else because of some error in his argument from change to composition. But because change seldom appears in discussion that touches on critiques of hylemorphic composition, it is not obvious where exactly the problem with Aristotle's metaphysics lies.

Historically, however, change was a central locus of philosophical enquiry, most notably in the work of Heraclitus and Parmenides, the former arguing that everything is in the process of change, and the latter arguing that change is impossible. Either position would pose a serious challenge to Aristotle's argument from change to composition. Examining the arguments, especially under the interpretation of Cohen (2002; 2003), it can be seen that refutations of either position require significant work. Even if sound arguments can be presented for the reality of change, ancillary work about its nature raises further important avenues of investigation, such as: is the changer necessarily something changing, too; (Feser 2017: 17-68) is there such thing as instantaneous change; (Oderberg 2006) are there infinite actual mid-points of a change, as exemplified by Zeno's paradox; is it the case that everything that changes has an agent of change; (Oderberg 2010) and are the compounds of change ontologically separable compounds in some cases, or do they only involve 'real distinctions' (to use the traditional term)? The question of change leads to many related questions that provide the means for laying out baseline metaphysical principles, like causation and substance, principles which seem indispensable for more specialised philosophical enquiries.

1.2.2 Does change presuppose a bearer of change?

When we talk about something changing, like a tree growing, we imply that change takes place in something; something stands under the change and persists through the change. In the case of the tree, it is the same tree that was once a sapling but has now reached maturity. Intuitively, we must posit an essence of this particular tree, its 'oakness', to be the bearer of its growth. However, when the tree dies, this is also a change, going from being some particular tree to no longer being any tree. What then is the bearer of this change? Since it cannot be 'oakness', bearers of some changes, like growth, cannot also be bearers of all changes, like growth and death. Bearers of change, then, appear to be principles of relative stability, but not principles of permanence. However,

if 'oakness' is not something permanent, is it therefore necessary for something to be its bearer of change; that is the bearer of the changes it undergoes, but of which it cannot be the bearer? Recursively applying this question would appear to demand a termination, namely something that does not undergo change at all.

Considering the question of change not only provides the opportunity for establishing metaphysical primitives, forming something like a toolbox for working on the mind-body problem among other things, but, far more importantly, it provides an opportunity for positing *the* metaphysical primitive. For, change is the manner in which Aristotle approaches the existence of God, the first principle of change that itself does not undergo change. (Meta XII, 1072a) Whilst Aquinas compiles four other ways in which to approach the existence of God from purely rational discourse, the way favoured by Aristotle appeals to common-sense experience, namely, that some things change, and so is perhaps the most accessible and compelling of the five ways. (ST I.2-26)

Two questions intervene between the reality of change, and the need for a fundamental, traditionally divine, principle. First, for change to be considered real, does a bearer of change need positing? And second, if so, does the bearer of change in turn require a bearer, ultimately terminating in an unchangeable bearer of change, or is it adequate for the bearer merely to be a principle that is more stable than the change it bears?

The connection of change with traditional arguments for God means that this topic is by no means of purely theoretical interest. Indeed, in a critical book review of 'Five Proofs of the Existence of God' (Feser 2017), Blackburn (2018) argues that the ascent up to God, arriving at the 'timeless, sunless realms' of 'subsistent existence itself' is an exercise in a 'dazzling and deceptive illusion' as its supposed gains in fact turn out to be empty-handed metaphysical catchphrases having no 'more content than a vacant "something-we-know-not-what"'.

Blackburn recognises that if such arguments were to establish philosophical knowledge of God then they might also ground the dictates of a specific morality, a morality that is enforceable, not on religious grounds, which can readily be dismissed into the so-called private sphere, but on rational, and thus universal, grounds. Even if the argument is successful, Blackburn would resist this on the grounds that we have 'no use for any conception of God', because 'we can never, according to the rules of just reasoning return back from the cause [God] with any new inference'. It appears that for Blackburn, whatever merit the proofs offer in getting us to that which we commonly refer to as God, attaining this conclusion is vacuous due to its lack of intelligibility.

Blackburn expresses scepticism about philosophers' claims to understand the conclusion that God exists (i.e. that there is an 'uncaused cause', etc.) and to rigorously develop the implications, especially dictates of morality. Engaging in rational inquiry into something so elevated as to be utterly opaque, and then forming conclusions which lend themselves to being enshrined in dogmatic imperatives, ought not have a place in philosophical discourse, according to Blackburn.

In response to the review, Feser (2018) argues that if natural science is to be intelligible it needs to be sufficiently backed up with a robust metaphysics. This, Feser claims, will involve recognising the conservation of a substance through its accidental change, assuming that the totality of causes are found in their effects, that a cause cannot produce just any effect but a limited range of possible effects, etc. But in backing up natural science with such a metaphysics, Feser argues, it can also be shown, albeit with difficulty and only narrowly at that, that rational accounts of the existence of God can be derived, and furthermore the essential properties of God expounded. Feser argues that 'all concrete reality is intelligible', and that to deny this either by denying that only some or else no concrete reality is intelligible would either be to select arbitrarily those things that fall into the capacity of reason or else to utterly deny any kind of scientific enquiry. Feser advocates pushing reason to the very limits of its natural powers, and defends this as a robust way of reaching knowledge of God, drawing upon the methods of the *via negativa* and the analogical use of language. Furthermore, he argues that to deny the robustness of the arguments used would also be to deny the foundations of scientific knowledge.

I shall argue, following Feser's interpretation of Aristotle, that the question of change leads to the conclusion that an unchanging principle that motivates change must be posited. Doing so is not a side topic en route to establishing the ontological nature of material things, but a question that cannot be avoided, and the manner in which it is answered considerably narrows down possible responses to the mind-body problem. Indeed, I shall argue that only one answer is left standing.

1.2.3 Is a material bearer of change hylemorphic?

The four causes, as presented by Aristotle, offer a way of giving an account of natural things, and are often presented through the exemplar of a living thing. (cf. Phys II.3; Meta V.2) The four causes, or four explanations as it is sometimes translated, are the material and formal causes (hence *'hyle'*-*'morphe'*, meaning 'matter'-'form') which answer the questions 'what is it made of?', and 'what kind of a thing is it?', and the efficient and final causes which answer 'how did the change come about?', and 'what motivated the change?' They offer a way of giving an account of substances, providing distinctions to communicate common-sense characteristics framed at a minimal level of philosophical precision. For example, considering a cow in its typical habitat, four perspectives on it may be adopted: that it is flesh and bone, specifically a domesticated breed of ox, bred at this particular farm, in order to produce meat for the farm. The account is holistic, offering a means of identifying the substance, its origin and its purpose. However, it is partial, as greater precision could be provided in the account, such as that the cow is of the female sex, its hooves are cloven, etc. Such precision could go on indefinitely, though what is typically required from an account is enough detail to identify and interact with the substance in an intelligent way.

Like change, the four causes appear to be in no need of a defence. They can be seen as common sense spelled out in marginally technical terms. But despite this, they have

generally come to be regarded with scepticism with respect to their ontological reality, even if many philosophers continue to acknowledge their explanatory power. (Robinson 2018) The formal and final causes tend to receive the strongest critiques among the four causes. Unlike the material and efficient causes, which seem more immediately part of ordinary experience —what things are made of and how things work— the formal and final causes can, at best, appear to be narrowly credible, and, at worst, appear to be absurd ideas. The formal cause is something that cannot be extracted and examined and yet it is said to inform matter. The idea of a final cause posits that both animate and, to a lesser extent, inanimate things have directedness, giving credence to the thesis that even sticks and stones tend towards certain ends.

The main focus of this last subsidiary question, however, is matter and form. These two causes are argued, by hylemorphists, to be distinguishable but not capable of existing separately, unless the form itself has capacities that are independent of matter, since, according to Aristotle, it is the substance itself that exists, i.e. that which is composed of matter and form. But, if form is not separable, and yet dictates the nature of a substance, where does it reside? If the answer were that it resides in the matter itself, for example as DNA in the case of the cow, the form would be nothing more than a specific detail of the matter, and so form can be dispensed with. Alternatively, if it is simply ascribed to the brute fact of the substance itself, that it is this way but could have been something very different, no explanatory power is found in the distinction. But for the Aristotelian, there is a real distinction that characterises and unifies and yet is out of reach of the experimental probe. Not surprisingly, then, this is a position that is readily suspected of metaphysical casuistry.

In eliminating form, matter becomes that which is real, and scientific study tends to become the leading authority on what the nature of things really is. Distinguishing between natural kinds, especially living things, and artefacts must then concern a difference in degree of complexity rather than irreducibly different kinds. This third part of the discussion will present a case for hylemorphic composition, and respond to some of the competing arguments.

This third subsidiary question may appear to be misplaced with respect to the first two. First, the experience of change is considered, and then following this step, abstractions from change are made that are common to all things that change and bear change. The first two stages clearly go from the particular towards the universal. However, in this final stage, material things are brought back into focus, a stage that would seem to fit more appropriately between the first two rather than after the second in order to chart a step-wise advance in abstraction. However, despite the seemingly out-of-order sequence, the placement of this third step is arguably in keeping with the manner of knowing:

> In order to understand the concrete singular as such, the intelligence, after having formed the universal concept, returns to the original experience that has led it to the universal, and superimposes the universal on the concrete beings: this

> operation is called 'return to phantasm', and it leads to further 'in-formation', i.e. to increasing knowledge, always in close contact with reality. (Torre 1981: 170)

The discussion of the material bearers of change in this third part may be considered a 'return to phantasm', and is advanced as the means for corroborating the abstractions developed in response to the previous subsidiary questions.

2 Change

This chapter aims to show that change is ontologically real and that there must be composition in change in order for it to be intelligible. Interpretations of Hercalitus and Parmenides are explored to assess the extreme positions on change; the former considering permanence as an illusion and the latter considering change as an illusion. The discussion will seek to show the valuable philosophical insights of their arguments, but nevertheless will go on to show that their arguments are ultimately untenable.

2.1 Everything changes

The assertion that for all material things 'everything changes' will be examined under two interpretations in the two following sections. The first interpretation is the claim in the absolute sense, namely that there is no principle of permanence whatsoever. For this interpretation, the critique of Feser will be presented to show that the position is untenable. The second interpretation is a more nuanced position, attributed to Cohen, whereby change is governed by orderly activity, so even though 'everything changes', the position introduces some principle of permanence, the permanence of differing kinds of change. It is this orderly activity that provides the principle of unity to things.

2.1.1 Nothing persists through change

Feser (2019: 13-20) interprets Heraclitus' position on change in an unqualified sense, as the view that *everything* changes. This is a standard interpretation, even if it is not explicit in one of the more popular claims of Heraclitus: 'in the same river, we both step and do not step, we are and we are not' (Fitt and Freeman 1983: 29). Rather, it is the received doxography from Plato:

> Heraclitus, you know, says that everything moves on and that nothing is at rest; and, comparing existing things to the flow of a river, he says that you could not step into the same river twice. (Cratylus 402A)

In nature there are changes in the material composition, location and quality of inanimate things, and in animate things further changes of conception, growth and corruption can be identified. The straightforward sense of 'everything changes' is that indeed, everything is undergoing continuous change in some way or another. Described in this manner, there would appear be be nothing controversial about 'everything changes'. But, a point of contention rests on whether or not change can take place in all respects at any given time.

To claim that there is complete continuous change in natural things, whereby everything from one moment to the next does not inherently preserve any continued identity or principle of stability, is the position Feser identifies with Heraclitus.

> Heraclitus [...] hold[s] [...] that there is no unity to the stages of the objects that common sense supposes exist, but only the multiple stages themselves. [...] There are no abiding objects of any [...] sort, but just various kinds of series of stages that we mistakenly suppose add up to persisting entities. (2019: 17)

One might suppose that it will be possible to defend the position that everything changes by appealing to the rate at which something changes — especially if it is something relatively slow with respect to human perception. However, Feser argues that this will not work. That a tree changes slowly, and so can be recognised and identified despite undergoing change, is not a kind of argument that could be appealed to for several reasons. Continuous change means that from one moment to the next there is nothing, in principle, that persists. Therefore, appealing to the timescales of changes in natural things as showing some degree of persistence does not respond to how, in principle, something actually retains any persistence. It is therefore to beg the question. Second, retention of a concept from one moment to the next by the person claiming to recognise persistence in continuous change would require some account of why concepts are exempt, in principle, from continuous change. If 'everything changes' were true, 'then there would not be such a thing as a single abiding mind which holds together long enough to [...] even formulate the view.' (Feser 2019: 18) Furthermore, continuous change has to appeal to certain universals in order to formulate the position.[1]

> For example, that there is the redness and roundness of a certain ball we experience at one moment, the redness and roundness of the ball we experience at the next moment, and so on, but really no such thing as the ball itself in the sense of a single persisting object that underlies these stages. (Feser 2019: 18)

Everyday experience tells us that things do in fact retain enough of a structure for us to regard them as being stable. If it is granted that at some level there is continuous change, like the continuous motion of atoms making up a living thing, there would appear, sitting at some level between those atomic movements and the changes in growth, etc, that there is indeed some kind of persistence. As to whether or not there is persistence, rather than simply a relatively greater stability, could be seen as a pedantic question. After all, there is nothing that is not capable of corruption in the natural world. An appeal to some principle of permanence is surely an appeal to something obviously non-existent. Furthermore, there appears to be a certain sense of arbitrariness about which level could

[1] Universals are a class of mind-independent entities, usually contrasted with individuals (or so-called 'particulars'), postulated to ground and explain relations of qualitative identity and resemblance among individuals. (MacLeod and Rubenstein 2019)

be taken as the reference level of persistence. Between an acorn and its growth into a mature oak there is no macroscopic appearance of persistence, an acorn does not look anything like an oak (at least until its fruit appears). At the atomic level, the proportion of the acorn that still constitutes the oak is at best negligible. A scientific response to the perceived persistence might appeal to the persistence of its DNA, even though this is something copied (and not necessarily perfectly) rather than preserved. Nevertheless, taking DNA as the reference of permanence could be argued to be just the least arbitrary choice, rather than an identification of permanence.

Despite the empirical evidence weighing against there being some material principle of permanence in the natural world, to go on to conclude that there is, therefore, only continuous change would undermine the the requirement for existence to persist through change.

> [Heraclitus] is implicitly assuming that there is no single entity underlying and tying together the stages we associate with a thing because he is implicitly assuming that there is only ever potentiality that never congeals into actuality, and thus nothing with the kind of reality that could count as a stable object. But in fact, since all potentiality is grounded in actuality, there could not be change in the first place unless there were some actuality stable enough to ground the potentialities that change presupposes. (Feser 2019: 19)

Consider the analogy of a motion-detection light. Whilst there is no motion the light is off, but nevertheless, *the capacity to change state* is actual (to use the metaphysical term). The light is potentially on, triggered by a potential movement. But an actual movement alone does not trigger the light, even though it is necessary; actual motion detection must be operating continuously. Potentials, then, may become actual, but only with the backing of an already actual state of affairs. Furthermore, whilst the change of state relates to a light turning on and off, there is no such requirement for the persisting cause to be of the same kind. Some electrical circuit powers the motion detection and potentially the light, and this persisting principle is characteristically measured in Volts and Ohms. On the other hand, that which changes is characteristically measured in Lumens.

Whilst the electric circuit ultimately backs the production of light, it nevertheless is a different kind of thing, manifested by its different base measurement units. Relating the analogy to change, even though the perceived change is of a certain kind, namely material, this does not mean that it could not be backed by a persisting principle which is of a different kind, albeit not radically unrelated to the principle that does in fact change. If change is to be understood in this way, then to be ever in the state of becoming something is to ever be in the state of not being anything. Hence something, in principle, must persist, thereby arguing for a compositional account of change.

Furthermore, for change to be intelligible, the range of change could not be unbounded. Potentiality does not mean some principle having the capacity *to become possibly anything*,

but rather *to become a range of things*. Returning to the motion-detection light, the operation of the whole unit would be unintelligible if, instead of triggering a light upon motion detection it triggered a jet of water, assuming the principle of actuality remained the same, namely the electrical supply. Whilst that which can be measured in Volts and Amps can be changed into that which is measured in Lumens, it cannot be changed into that which is measured in Kilograms and having the various properties of water. Electricity can be converted into many things, but not *anything*. This position may be denied by appealing to the equivalence of energy and mass, by the relation $E = mc^2$, whereby anything can become anything else (or at least electricity could, in principle, be converted to water). Even so, energy and mass are convertible *in some particular manner*. One Joule of energy is not convertible to one Kilogram of mass, but at least $8.99\,x10^{16}$ Joules are, in principle.

For any change to come about, a potential must be actualised, and this must be by something that is already actual, according to the principle of causality. (Feser 2017: 32) In the extreme Heraclitean view that change can take place under all aspects, however, this points towards notions of continuous creation and annihilation rather than change. In this scenario the principle of causality has no direct application, as there is nothing that serves as a proximate actual cause to bring about change. Therefore, if change under all aspects is to be posited, some external agent of change would be required in order to satisfy the principle of proportionate causality. This second principle requires that whatever is found in the effect must be found in the totality of the cause, in some way or other, be it formally, virtually, or eminently.

> In scholastic terminology, an effect is contained formally in a cause, when the same nature in the effect is present in the cause: fire causes heat, and the heat is present in the fire. An effect is virtually in a cause when this is not so, as when a pot or statue is caused by an artist. An effect is eminently in a cause when the cause is more perfect than the effect: God eminently contains the perfections of his creation. The distinctions are part of the view that causation is essentially a matter of transferring something, like passing on the baton in a relay race. (Blackburn 2005)

Radical change rules out the effect being found in the cause formally, like the growth of a tree whose 'oakness' persists through the change. It also rules out the effect being found in the cause virtually, like a tree being chopped down to be used as fuel for a wood burner, since a capacity persists despite the form of 'oakness' corrupting. Beyond this, only an external agent serving as the eminent cause could explain the totality of change, along the lines of continuous divine intervention. If this third possibility of eminent causation could be countenanced, the action of divine intervention would also be needed to make the change intelligible to a human intellect, since there is no reason why an exclusively divine action ought to be within human intelligibility. To defend such a line of reasoning, the

permanence of the divine intervener would need establishing, thus bringing the argument back to Feser's critiques.

2.1.2 Orderly change persists

In this section Cohen's interpretation of Heraclitus' assertion that 'everything changes' will be considered. Doing so is not for the sake of offering a more authentic account of Heraclitus, although it would appear to be, but rather in order to identify some characteristics about change and permanence. Feser argues that there must be, in principle, something that makes things be at any moment in time. Cohen's interpretation does not attempt to deny this, but rather to present considerations on what makes something persist at any moment in time. Cohen presents a more subtle view of Heraclitus, acknowledging his insight that 'nature likes to hide.' (Fitt and Freeman 1983: 34)

Cohen's reading of Heraclitus is that he does not deny there are persisting objects but rather that an object does indeed undergo continuous change in some respect or other, but not in all respects throughout any change. (Cohen 2002) Based on his interpretation, a passable but much less extreme position of Heraclitus could be stated as change is continuous for all things in the natural world, but nothing changes in all respects for any given process of change.

Heraclitus' thought on change, as understood by Cohen, concerns the coexistence of opposites in a unity. Based on the earlier remark attributed to Heraclitus that 'you could not step into the same river twice' it could reasonably be concluded that he thought that change in quantity, the water that flows down the river, was the principle cause of change, and that static structure was the principle cause of stability through change, like the river banks directing the flow. In fact, Heraclitus seems to consider that underlying activity or change, which may not be immediately obvious and may only be recognised upon reflection, is the bond of unification of an object itself, rather than at least something being held in common under change. Cohen cites the example from Heraclitus of a drink whose ingredients readily separate if the mixture is not stirred:

> The 'mixed drink' (Kykeôn: mixture of wine, grated cheese and barley-meal) also separates if it is not stirred. (Fitt and Freeman 1983: 34)

It is a kind of continuous activity, in this case of mixing, that keeps the drink as such in existence, not merely its ingredients being arranged and set once and for all as though the stability of the drink persisting implies the reaching of a static equilibrium. Persistence of something, then, is itself an act of change, change that moves mere collections of things into some single coherent whole. Furthermore, it is not an incoherent kind of change that provides the unity, but rather an orderly kind of change, such as that of stirring, for example. The insight of Heraclitus is to posit orderly change as the bond of unity, or stability, that stands under any other kinds of change. Whilst the agent of orderly change is left unclear, it is common to the whole of the natural world:

> This ordered universe (cosmos), which is the same for all, was not created by any one of the gods or of mankind, but it was ever and is and shall be ever-living Fire, kindled in measure and quenched in measure. (Fitt and Freeman 1983: 27)

The dynamic principle of persistence through change is further exemplified by Heraclitus in things that have the appearance of being static and unchanging. In his examples on unity in opposites, he considers a stringed instrument whose structure maintains the strings in tension. Here, the very act of maintaining the balance of tension is the action of opposites in a unity. Excessive pull on the strings would collapse the structure of the instrument, whereas the resistance of the structure retains the integrity of the instrument.

> They do not understand how that which differs with itself is in agreement: harmony consists of opposing tension, like that of the bow and the lyre. (Fitt and Freeman 1983: 29)

Under Cohen's interpretation of Heraclitus, matter does not play a crucial role in the persistence of things undergoing change. If the quantitative make up of something were to be utterly replaced, so long as it is through orderly change, there is persistence of the thing itself. Nothing about Cohen's reading of Heraclitus challenges Feser's rebuttal of an extreme interpretation. What it does offer is a consideration about the manner of change, that it is something orderly. The emphasis on order as appose to static structure, for example, exposes change to not simply be something exclusively in the ontological order accessible to rational and non-rational beings, but something that requires the intellect to perceive order so as to recognise change. This kind of view is typical to a Scholastic account of change:

> The sensible world is the world we see through our senses, while the intelligible world is the world we see through our intelligence. When we 'see' being, we see it with our intelligence, not just with our eyes. The eyes do not see being, they only see colour or shapes. But the intelligence sees not only being (and substance and accidents) but also change. Change as such is only intelligible, not sensible. It is a concept the intelligence makes out of (a) the concept of stage before the change, and (b) the concept of stage after the change. The former is ability-to-be or capacity-to-be: potency or potentiality; and the latter is the being-in-act or actuality. Change is the passage from (a) to (b). The being of something changeable is not only what it actually is, but what it can still be. (Torre 1981: 48)

It would be a stretch to imply that notions of Aristotelian hylemorphic composition can be found in Heraclitus' account of change under the interpretation of Cohen, but there would appear to be the beginnings of such a view. What makes a person the same person throughout his life, despite an almost total change in matter? Orderly change might well be the answer favoured by Heraclitus; form would be the answer proposed by Aristotle. They are not the same thing, but form does, among other things, impose order.

2.2 Change is an illusion

A standard interpretation of Parmenides, as expounded by Cohen, is that change is impossible, since only things that already exist can be thought about (first premise), and if something does not already exist it cannot come to exist since something cannot come from nothing (second premise). Change, therefore, must be illusory. Parmenides' argument entails that 'it is possible for x to exist if and only if it is possible for x to be thought about, i.e. if and only if x is conceivable.' (Cohen 2003).

> Come, I will tell you — and you must accept my word when you have heard it — the [two] ways of inquiry which alone are to be thought: the one that *it is*, and it is not possible for *it not to be*, is the way of credibility, for it follows Truth; the other, that *it is not*, and that *it* is bound *not to be*: this I tell you is a path that cannot be explored; for you could neither recognise that which is *not*, nor express it. (Fitt and Freeman 1983: 43)
>
> For it is the same thing to think and to be. (Fitt and Freeman 1983: 43)

The 'two ways' of Parmenides directly challenges the position of Heraclitus, be it the more extreme interpretation of Feser, or the more subtle of Cohen. Whether it is 'that at every moment, every object is changing in every respect', or 'that at every moment, every object is changing in some respect or other', change is an illusion. His two ways suggest that what can be known must exist, whereas what is not cannot be known and so cannot be investigated. The position has a resemblance an idea of Plato's, where he states that 'speaking is always speaking of something, ... there is no such thing as speaking of what is not.' (Sophist 237BD-E)

That change is impossible is a conclusion of Parmenides' thought, and so are the conclusions that there is no coming into existence or ceasing to exist, no movement and, arguably, no plurality. Change and movement would require temporal differences, but Parmenides rejects this possibility as this would require some state of affairs going out of existence and some new state of affairs coming into existence. There can be no coming into existence of something as that would imply a time when it did not exist, and to recognise this possibility would be to recognise the possibility that something can be conceived of without existing. As to the conclusion that there can be no plurality, interpretation is not unanimous: Feser interprets the position as one of static monism, whereas Barnes argues that monism is not a feature of Parmenides' thought.[2] (2002: 163-64) Cohen queries 'why can't there be a world of *many* ungenerated, unchanging, indestructible things?' (2003) He, nevertheless, speculatively formulates ways in which Parmenides may have defended monism. If there were two things, a and b, in order to differentiate them there must be some property F that a possesses but b does not. However, saying, or 'conceiving', that b does not have F is impossible, since one cannot conceive of what does not exist.

[2]The denial of change is what makes static monism *static*.

Despite the extreme nature of this position, it is one that needs to be responding to. Earlier on, radical change, or pure possible being, was dismissed by Feser since some account of actual being is needed. Cohen's interpretation of Heraclitus offered a principle of persistence, orderly change, but still without elaborating on the origin of the principle of order in 'orderly change'. Without this principle being accounted for, no interpretation of Heraclitus could be maintained. But, if a principle of order is posited, it must be more fundamental than that which undergoes the ordering, and, furthermore, must not itself be dependent on orderly change itself. The position of Parmenides, then, is arguably a more fundamental level of reality than that of Heraclitus because the latter is attempting to give an account of an underlying and fundamental principle. Because of this, there is a sense in which it has considerable accordance with a typically Scholastic view of reality, that *to be*, or being, really is the most real thing that we can know, and it is knowable only by abstracting away all association to matter. As Torre writes:

> Types of science can be classified according to the various degrees of elevation above matter. Matter designates the world we perceive through the senses, and its first characteristic is that it is in continuous change. But science is a stable knowledge, one that does not change. Since matter is the ground of change, in order to reach real scientific knowledge of reality *we have to rise above matter* in order to discover general and stable patterns. A second degree of elevation above matter studies beings which although cannot exist without matter can be thought of or conceived without matter, the science called mathematics. The third and highest level of abstraction above matter considers beings which can both exist without matter and be conceived without matter. At this level *we are looking at being as such*. To focus on being requires, therefore, the highest separation from matter. This separation is not a flight from but a much more *pervasive penetration into reality*. It is the level of metaphysics. (1981: 44-45)[3]

Parmenides' position involves a tight coupling between the intellect of the knower and the world that he can come to know, a coupling that appears to be exclusively speculative on the part of the intellect with respect to things (or 'thing' if a monist reading were assumed). The view of Parmenides seems to be that the intellect can know and should know the things of the world, but there does not appear to be any reality to the creative capacity of the human intellect, such as possessing the intention to fabricate a vase from a block of clay, nor does there appear to be a reality to natural things changing. For Parmenides, the state and extent of reality is bounded and closed irrespective of supposed contributions made by human ingenuity and activity.

In order to offer some corroboration of Parmenides' argument, the limited power of human activity could be considered under two aspects that favour a bounded and closed reality. The first is the challenge of a thought experiment to conceive of something that bears no association to anything of experience. It is reasonable to say that we cannot.

[3]The quote is heavily paraphrased. Emphasis added.

> For, as a matter of fact, painters, even when they study with the greatest skill to represent sirens and satyrs by forms the most strange and extraordinary, *cannot give them natures which are entirely new*, but merely make a certain medley of the members of different animals; or if their imagination is extravagant enough to invent something so novel that nothing similar has ever before been seen, and that then their work represents a thing purely fictitious and absolutely false, it is certain all the same that the colours of which this is composed are necessarily real. (Descartes 1911: 7)[4]

Whilst we can think of mermaids and centaurs and regard them as original, it would perhaps be more accurate to describe them and mere imaginary compositions of real things: woman-fish and man-horse. Similarly, even with a vivid imagination of these composites, it is not so obvious what the content of the thought would consist of beyond the mental image. How does the mermaid breathe underwater? Tentative answers could be given, but even with only a superficial enquiry about imaginary compositions, this would be enough to derail a claim that the composition itself is somehow real, or that it involves more than a conjuring of things previously experienced.

The second consideration is the manifest inability to fabricate something with its own intentionality. On the one hand there is the common-sense reality than humans make things intentionally, fabricating them from other things around them. But on the other hand, we cannot make anything properly original, having its own inherent tendencies. Whilst making pots out of clay shows our own intentionality applied to things lacking intentionality, we seem to be unable to impart the intentionality that we possess. We can imitate intentionality in computer programs that 'dialogue' with its users and claim that an intentional being has been fabricated. However, to claim intentionality has been imparted, at least in this kind of example, has been refuted by Searle (1980). If something is to be brought into being in a non-trivial sense, a manner that is significantly different from the rearrangement of what already exists, the imparting intentionality appears to be such a standard to distinguish the difference.

These two considerations exemplifying the limitations on the human ability to perform a creative act, be it *conceiving* something new or imparting intentionality in fabricated things to *create* something new, emphasising the same kind of limitation. Both point to powers of composition but deny the possession of creative powers; neither conceiving nor creating seem truly possible. What is possible is composing thoughts or things in some way or another, but neither could be considered the touchstone of reality. What is real in a primary sense are the things of nature. From these two considerations, rejecting change as the movement from something to something that is as yet non-existent does appear to bear some plausibility, insofar as radical novelty can neither be thought about nor fabricated.

To view the position of Parmenides, then, in a way that acknowledges common-sense

[4]Emphasis added.

experience, change may be regarded in two senses. The primary sense being creation and annihilation, which he argues never occurs, and the equivocal sense, which is commonplace, that imagination (or, more generally, thought) and fabrication do occur but they are not change as such, but mere compositions or rearrangements of existing things.

> The idea of 'arrangement' is how Melissus, follower of Parmenides, describes change: 'If a thing changes in any respect, it is rearranged; if it is rearranged, a new arrangement comes into existence. But nothing can come into existence.' (Cohen 2003)

Conception and death do not neatly fit into either of these as neither creation-annihilation nor fabrication-dismantling captures the qualities of something coming to be from pre-existing things, namely parents, but not due to fabrication. Nevertheless, a reasonable Parmenidean-like approach might put emphasis on the idea of the changelessness of species as what is real, and its propagation in time as appearance of change. This idea is, in part, found in Cohen's interpretation:

> A more plausible line of argument might go like this: Parmenides thinks that the world is devoid of movement or qualitative change [...] indeed, there cannot be difference of any *kind*. (2003)[5]

The argument of Parmenides that 'all that is is being, and changeable things are illusory' is dismissed by Plato when he points out that not all denials are denials of existence, for 'when one says that cows don't fly, one is not referring to flying cows, and saying of them that they don't exist. One is referring to cows, and saying of them that they don't fly.' Despite this logical error, Parmenides does plausibly insist on a fundamental premise, that nothing comes from nothing. In this premise are the origins of a number of metaphysical principles, such as the principle of non-contradiction, and the principle of proportionate causality.[6] It is because Parmenides grounds his position in at least some well established philosophical axioms that a greater degree of work is needed to refute his argument than that of Heraclitus. Nevertheless, Feser does refute Parmenides, but for different reasons to Plato. Applying the 'inverse' of the rebuttal he uses against Heraclitus, he argues that change must be real in order to entertain the very argument that change is an illusion.

> For Parmenides to work through the steps of his argument, he has to entertain its initial premise, then to entertain its succeeding premises, and then to entertain its conclusion. He will also thereby have gone from believing that change is real to wondering whether it is in fact real, and finally to being convinced that it is not real after all. But all of that entails the existence of change. (2019: 14-15)

[5]Emphasis added.

[6]The principle of non-contradiction states that a thing cannot be and not be at the same time in the same respect or relation. The principle of proportionate causality states that the effect cannot be greater than the cause. (Wuellner 2011: 31)

Feser, in offering an Aristotelian response to the problem of change, points out that it is mistaken to understand change as a movement from being to non-being, or vice versa. Change assumes being, as already argued by Torre.

> Parmenides held that change entails being arising from non-being, which is impossible. The Aristotelian agrees that it is impossible for being to arise from non-being, but denies that that is what change involves. Among the things having being, we can distinguish actualities and potentialities. [...] Given that a potential is something really in a thing, a change to the thing involves being of one sort (in the traditional jargon, being-in-potency) giving rise to being of another sort (being-in-act), rather than non-being or sheer nothingness giving rise to being. (Feser 2019: 15)

2.3 At least some things change

In examining the positions of Heraclitus and Parmenides, the conclusion that at least some things change has been shown to be unavoidable. At least the person coming to adopt the position x, where x may indeed be anyone of the variant arguments on change, or any argument at all, at least he must undergo change in some way, from not holding the position to holding it.

But not everything can be in the state of change. At least something has to be prior to a process of change, possessing some degree of actuality. If reality was purely possible being, nothing would serve as a terminal for change. Despite the logical certainty of this position, exemplifying the difference between a process of change and the beginning and end (the terminals) of change appears to be just outside of our grasp. Change cannot be pointed to or divided up endlessly into partial changes for examination, since 'change as such is only intelligible, not sensible.' (Torre 1981: 48) What about the 'changing of mind'? Since this was a principle route for reaching the conclusion that not everything can change, perhaps this avenue could offer some way of discriminating between change and terminals of change. Is there a real state of mind that actually exists in the activity of going from 'not knowing that at least some things change' to 'knowing that some things change'? A possible answer could be 'yes, entertaining the possibility but without assenting to its truth.' But this would only push the problem back a stage without actually answering it, since the movement from entertaining to assenting is essentially the same issue. There does appear to be something paradoxical about the process of change, since in some sense it does not appear to be a 'process' at all when a middle ground apparently cannot be admitted. Nevertheless, there must be terminals of change.

As has already been mentioned, the thesis that there must be change as opposed to no change whatsoever can be supported by an appeal to a person changing his mind. However, there is an asymmetry between the extreme of Heraclitus and the extreme of Parmenides, one which substantially favours Parmenides. The weakness of Heraclitus' argument is that it made no account of what it is that imparts 'orderly change', implying

that even if there is change, something must govern it. Change, even for Heraclitus, under Cohen's reading, is derived, a product of orderly change. Parmenides, on the other hand, seeks to understand that which is fundamental, and in the process dismisses change as illusory. Whilst it has been argued that it was mistaken for Parmenides to dismiss change, he nevertheless dismisses something that is derived rather than something that is fundamental, unlike Heraclitus (arguably). It is conceivable, therefore, that Parmenides' argument could be true, so long as there was nothing possessing a capacity to change, and this is conceivable insofar as change is a derived reality. It is for this reason that there is more strength to Parmenides' position than to Heraclitus'.

Parmenides insists that 'only what exists can be conceived of' as a central claim. Two kinds of examples were given earlier that offered partial corroboration of this claim, considering the limited human capacities of imagination and fabrication. But, could there be a being that does not have such limitations of thought and fabrication such that conceiving of and bringing into existence are univocal terms? Could there be at least one being for whom it is impossible to think about what does not exist? If such a being were to exist, much of Parmenides' onotology would be tenable, since it is plausible that this same being could not be subject to change itself. A sketch of a supporting argument could be: since the limited human capacity can conceive of change, then so could a being with greater conceptual capacity. Furthermore, in this being conceiving of change, change would also come into existence. Since coming into existence is the most radical sense of all possible change, the principle of persistence through such a change must exist independent of all possible kinds of change, including the most radical sense. But to persist through all possible kinds of change just is to persist outside changeable reality. Following on from this, all the concepts, and therefore, realities, must exist outside a changeable reality.

The question of the ontological reality of change strongly suggests the need for some principle that can support change. Feser introduces the solution of principles of potency and act from Aristotle's metaphysics as a solution which captures the essential characteristics of both Heraclitus and Parmenides. For the former: that everything is changing, but with the qualifications of 'but not in every way' and 'at least in the natural world', and for the latter, that there must be a principle which is not undergoing change, but with the qualification 'at least in order to support the reality of change.'

The next chapter will develop Aristotle's theory of act and potency in two stages. First, by starting with natural things, in a similar fashion to Heraclitus, and developing the notion of change being 'present in' bearers of change through the categories, or predicaments, of Aristotle. The second stage seeks to draw a relationship between change and bearers of change with potency and act, elaborating on the attributes of these principles of composition.

3 Bearer of change

The previous chapter argued that change is real, and that in order for a change to take place there first needs to be a 'something' that can undergo change. The principles of potency and act were introduced as a minimum requirement for the distinction between the possibility something else, and the actuality of being something here-and-now.

This chapter aims to expound the nature of these two principles and their relation to each other in order to make possible the position that there is persistence through change. Whilst potency and act justify the very existence of change, the principles of potency and act do not obviously answer the question of what makes something recognisably the same thing through change, like a sapling growing into a tree.

There are two main views about this question. The first view of change I shall term as 'atomic': change is real but from one change to the next there is no persisting essence.[1] The second view is that which Oderberg calls 'real essentialism': there is a persisting essence that grounds identity through change.[2] This chapter considers which view we take, having adopted the principles of potency and act. An atomic view was rejected in the previous chapter insofar as a person wishing to hold it would in the same act undermine the position being true for him. However, it does not follow from that argument alone that an atomic view of change is not true of non-rational beings.

The position of real essentialism will be defended and I will attempt to show that it is 'act' that grounds all intermediary bearers of change. This will be defended by arguing that persistence through change has a hierarchical dependency on some terminating principle that is absolutely unchanging. If, on the other hand, an atomic view were indeed shown to be pervasive, either the exception for human minds would need to be maintained, or else the argument of the last chapter would need to be revisited in order to see if it goes wrong somewhere.

[1]The 'atomic' terminology is taken from Pinckaers and Noble (1995: 336), where it is applied to the distinction between freedom of indifference and freedom for excellence. Freedom of indifference, atomic moral action, consists wholly in a choice between contraries and separated from all the actions preceding it or following it. Freedom for excellence, on the other hand, consists in habitually ordering acts with the perspective of the final end of the human person, happiness.

[2]'Real essentialism defends the metaphysical position that everything in the world has an essence or nature that fixes its identity.' (Oderberg 2007)

3.1 Hierarchy of categories

Aristotle proposed a collection of distinctions that could be applied to things to characterise them. Following the sentence structure whereby a subject is described by a predicate, Aristotle built up a collection of ten predicates, or categories, that he considered true aspects of things found in the world. (Cat 1b25–2a4) For example, 'Felix is a cat', and 'Felix weighs four kilograms' presents two of these categories. The first is what Aristotle calls a substance, 'cat' in this case, and is the name than distinguishes what kind of thing the subject is. In taxonomical classification this would be the full name of the proximate genus and its specific difference (*Felis catus*, say), thereby marking out a particular species. The second is its quantity. Other categories were also described by Aristotle, such as quality and relation, but these first two suffice for examining the credibility of there being a bearer of change which is also a bearer of essence.

An important insight in the Categories is that we can distinguish predicates for the sake of enquiring about a subject under some aspect or other. Designing cat flaps would be concern quantity, such as the average size of cats, but not quality, such as their propensity to hunt mice. A second insight of the categories is their hierarchy. Aristotle places the substance category first, and this is followed by nine categories, referred to as accidents. The distinction he draws between the substance and accidents of a particular kind of thing (primary substance and accidents) is that the latter are only ever 'present in' the former.[3] The quality 'black' is present in 'cat', for example. This ordering of categories conveys that not all distinctions are equal in relevance from the perspective of the persisting subject.

> It is a distinctive mark of substance, that, while remaining numerically one and the same, it is capable of admitting contrary qualities, the modification taking place through a change in the substance itself. (Cat 4b17–19)[4]

If a hierarchy of categories were not to exist, whereby there were no such thing as one which was the bearer of others, then it is conceivable that an atomic view of change could prevail, with the only defensible exception being the human mind, as argued in the previous chapter. Such a position would entail that one could hold either that there is a cat weighing four kilograms or that there are four kilograms of cat-like quantity, since at any given moment one would have to be impartial toward all categories, be it substance or quantity, etc. For example, this would be the case if there is some objective sense in which it is a cat that has the quality of weighing four kilograms, rather than a four kilogram thing that has the quality of being catish.

[3] A similar distinction is be made between the substance and accidents of universals (or secondary substance and accidents), as discussed in Studtmann (2018).

[4] The 'taking place through a change in the substance itself' is interpreted here as meaning 'change in the composite' rather than change in the bearer of change, since 'substance remain[s] numerically one and the *same*'.

In order to defend Aristotle's hierarchy of categories, some way of showing why one category must be the bearer of other categories needs to be demonstrated, showing how at least one predicate can be said to be a greater principle of persistence than another.

3.1.1 Immanent activity

Common sense suggests that Felix, a now mature four-kilogram cat, was once only one kilogram but, nevertheless, is still the same cat. Quantity, then, appears to be a relatively independent category. Indeed, quantity may change continuously, albeit to a relatively small degree, without causing the corruption of the kind of thing that bears the quantity. But, if all categories were like the category of quantity, admitting continuous, and possibly wide ranging, change, the notion of 'bearer of change' would have very little meaning, nothing more than that offered by the principles of potency and act developed earlier.

To argue that there exist bearers of change in an objective, fundamental sense, it is necessary to explain why cats vary in weight rather than weight varying in cattishness. That is, it is necessary to explain why this very object can survive a change in weight, if it remains a cat, but cannot survive a change in whether or not it is a cat, so long as it remains the same weight. To answer this question, the transition from exhibiting immanent and transient activity to exhibiting only transient activity will be considered. Is the change from living to dead a change which can only be accounted for by a loss in an irreducible principle, its bearer of change?

> Living things, unlike non-living things, exercise *immanent* causation: this is a kind of causation that begins *with* the agent and terminates *in* the agent for the sake *of* the agent. *Transient* causation, on the other hand, is the causation of one thing or event (or state, process, etc.) by another where the effect terminates in the former. All exercises of immanent causation involve transient causal relations as effects and/or instruments. (Oderberg 2007: 180)

Exemplars of things that appear to possess an irreducible bearer of change are living things. At least in most living things it is generally held that there is some sense of an identity that persists despite near total change in quantity during their lifespans, or whereby memories and concepts are retained, or whereby certain ends are sought. But, is it the case that for each thing there is just one bearer of change? Two characteristics point towards an expected hierarchical view. The first is that change of quantity is partly reversible, the weight of Felix may vary non-trivially throughout its adult life. But once dead, there is no reversible process. Things change, but the example of death suggests that the kind of changes something could undergo, at least living things, are not all changes in a single sense. Some changes, like quantity appear to be less important with respect to the integrity of the thing itself compared with change from being the possessor of immanent activity to exclusively transient activity.

> Substances undergo changes while remaining the same in their being. It is accidents that come and go. The substance has potentially many accidents. Substance

> is to accidents what potency is to act, and as act perfects potency, so accidents perfect the substance. We also observe that substances change not only by addition or subtraction, but by becoming other substances. Substances do not change into any sort but into very specific substances. Before a substance changes into another, it has the potentiality to become precisely that one. A substance has not only the potentiality to receive and lose accidents, but also the potentiality to become other specific substances: two types of potentialities, one at the level of the accidents, and the other at the level of substance itself. (Torre 1981: 49)

3.1.2 Classification

The task of classifying Felix the cat, or indeed anything else, is principally a task of going from the observation of attributes, like the colour of its fur, to seeking divisions among things that are seemingly pick out essential characteristics, like whether or not it is a living thing. This kind of enquiry seeks to recognise two important matters: the difficulty in perceiving what is a readily changeable attribute from what is 'standing under' it as the support or grounding that permits the changeableness whilst retaining the stability and uniqueness of the thing itself; and secondly, the broader matter of what, ultimately, is being classified.

For the first of these two matters, we could say that a cat is a vertebrate, which is an animal, which is a living thing. But does, for example, 'is a vertebrate' divide along an essential line, a characteristic which is stable and must persist for the thing to remain what it is, or is it an arbitrary division that groups creatures eclectically, having no further likeness than the mere fact of having a spinal column? The task of classification suffers the difficulty of moving from perceived attributes to essential characteristics and appears to reflect the underlying philosophical difficulty of recognising what is essential from what is non-essential.

The search for the identity of something then, could be considered like moving inward through concentric circles of attributes, from those that are more peripheral to those that are more fundamental.

> There seems to be a hierarchy of attributes to which we attach relative importance in grasping a thing's identity [...] from the periphery where certain attributes [...] have fairly transitory importance, towards the center where [...] characteristic function assume dominance. (Oderberg 2005: 79)

All are real attributes but arriving at the centre we come to know that which essentially distinguishes and so identifies what something is. Returning to inherent tendencies, a similar picture should be expected. For substances with the highest natural capacities it would be expected that they have more readily identifiable principle of inherent tendencies and a spectrum of subordinate inherent tendencies given that such substances would not only possess the highest natural capacities but a whole host of subordinate capacities.

Justifying the notion of such hierarchies is simply achieved from defining a superior capacity as being one whereby it entails an inferior capacity if the former entails the latter but not vice-versa. For example, sentience is superior to nutrition as the sentience depends on nutrition, but nutrition does not depend on sentience.

> F-type capacities are superior to G-type capacities just in case the former entail the latter but not vice versa. [...] [T]he nature of a thing is defined in terms of its highest capacities. (Oderberg 2005: 88)

Allied with this rule for determining dependency in a living organism, a case can be made for preferring an essentialist view of change as opposed to an atomic view. If there are indeed objective hierarchies in living things, there is at least some principle that must be more stable than another in them. Classifying things then becomes a task principally concerned with identifying the most dependent capacities in living things, since these will reveal the differences among like things.

The movement from the least dependent to the most dependent capacities in the hierarchy of a living thing appears to be a movement from what is more changeable towards what is more stable. At the species level, a cat's fur may change colour, it may malt or lose a limb, or undergo many kinds of fine grain changes, but still be the same cat, a *Felis catus*. Changes that fall below the granularity of the species, however, are simply no longer relevant to the kind but only to the particular instances of the kind. This dividing line is not obvious though. Classification is seeking to construct hierarchy of dependences and place the most dependent as characteristic of a species. Seemingly trivial differences, however, are also hierarchically highly dependent. A not so different cat, at least to the naked eye, is the *Felis lybica*, with a slightly leaner build and slightly longer legs, and a few other pertinent features. Somehow these small differences are enough to classify it as different species. At one end of the spectrum, if the essentialist position is to be robustly defended then some means to draw a line between what are the most dependent capacities *of a stable kind* and what are merely variations of given capacities in a kind is wanted. Oderberg seems to acknowledge this difficulty but responds to the problem by pointing towards the individuation of an irreducible principle as being the true locus of what divides the essential from the non-essential, namely powers that are proper to the substantial form.

> In general, what matters are the congeries of powers, operations, activities, organization, structure, and function of the object, whether it be something as bare as shape in the case of the diachronic identity of a circle drawn on a piece of paper, or something as complex as character in the case of the identity of a relatively higher animal such as a dog. ... Hence, *it is Rover's special way of barking at dinner time that is of more relevance than his color* —after all, he could have been swapped for a twin from the litter— and it is his mournful mien when re-

> fused a walk in the park that is of more relevance than his enthusiasm for chasing postmen. (Oderberg 2005)[5]

At the other end of the hierarchical spectrum there are the least dependent characteristics, those of greatest stability. A cat is a vertebrate, which is an animal, which is a living thing.[6] But what lies immediately beyond 'living thing'? What is found at the highest taxonomical category; is it a kind which is still only *relatively* stable or is it a kind which is permanent? Something, substance or being are terms that may be used to denote the wider taxonomy category above living thing, but none of them obviously convey whether or not permanence is an essential characteristic of it.

By extrapolation, the most general classification must have the greatest degree of permanence, as it can admit all possibilities of variations by definition. For this reason 'substance' appears as a reasonable term for the most general category since it is never 'present in' anything but rather the bearer of possibilities. Furthermore, 'substance' reflects the sense of stability expected from ascending to the highest level of classification; what readily changes are the accidents of things, like the cat gaining weight, rather than substance becoming something entirely different, like the cat dying. But substances, at least when considered with respect to living things, do not appear to be permanent things as such. When a cat dies it ceases to be a cat.

Both thesis that a substance (its substantial form) is something necessarily unchanging and its negation presents difficulties. If substance were necessarily unchanging, it would be impossible to have taxonomical division whereby changeable substance could be introduced since its alternative would have to be unchanging substance, but that is already assumed in term already. Secondly, with respect to the theory of evolution of species by natural selection, this theory would be ruled out in principle since the bearer of change is required to change, i.e. the macro-evolution of new species developing from some pool of existing species, mutations and circumstances of habitat, rather than merely changes in the accidents present in the bearer of change, i.e. the micro-evolution of a species to adapt to a certain environment such as dandelions flowering with a short stem in grassy areas which are regularly mowed. The position of substance being unchanging does appear to have support in both Aristotle and Aquinas. For Aristotle, 'matter comes from matter and form comes from form, what is generated are composites.' The argument being made seems to be that form, i.e. substantial form that is the bearer of change for material composites, cannot be changed by some other principle, such as matter (or for Aquinas, prime matter), nor by its composite. The principles are irreducibly distinct and therefore are not subject to changes by each other. Even though cats die and wood is burnt to ash, this would not mean that the bearer of change has changed but rather that the composite has corrupted. Nevertheless, what happens to the bearer of change upon

[5]Emphasis added.

[6]That a cat is not a vertebrate *and* an animal *and* living thing, and so being a cat could not survive despite no longer being a living thing, is argued by Oderberg (2005: 81–83).

corruption of the composite is not altogether clear. Standard terminology states that the substantial form corrupts *with* the composite, unless it possesses operations which are inherently independent of the compound material principle.

On the other hand, if substance were not necessarily unchanging, it would be reasonable, if one were working from the most general towards the most specific categories, to make the first division as 'changeable substances' versus 'unchanging substances', and then fill out the various divisions under 'changeable substances'. This, however, would introduce a logical problem. The 'unchanging substances' division would sit lower down in the taxonomy hierarchy, and therefore have greater affinity with species than 'substance' since unchanging substance would be that one level closer to species than substance itself. Secondly, having the division unchanging and changeable subordinated to substance would necessarily give 'unchanging substance' a greater sense of permanence than 'substance' itself has, despite the latter being more fundamental and, presumably, more stable.

We might dismiss both arguments on the grounds that taxonomy starts with what is known, like the various particular cat-like creatures, etc., and then groupings are worked out. Speculatively starting at the top and hoping to get meaningful divisions that describe the essences of particular things is simply not how categories are developed. Alternatively, we might interpret the problem, not as a logical problem, but as proof that the hierarchy of grater and lesser generality does not map perfectly onto the hierarchy of greater and lesser stability after all.

However, dismissing the issue as an esoteric metaphysical problem that is not worthy of resolving would create problems for the application of the metaphysical theory in other areas, such as ethics. If it is the case that substances, or more precisely, substantial forms, are not necessarily unchanging then at least Natural law cannot be robustly defended since what may have been actions in accordance with the natural faculties of one genus of *Homo* at one time may no longer be the case at a later time, among the same descendants, due to *substantial* changes. The position of substantial form being necessarily unchanging has the authority of at least one broad philosophical school of thought, namely, the Aristotelian-Thomistic, but could readily be seen as pre-scientific. The alternative, where substance is not necessarily permanent, poses merely an apparent breach of the general rule that greater generality means greater stability, and so only a reduction in the elegance of the resulting theory.

The breach of accordance between generality and stability is not the only problem with taking the position that substance could be open to change. The fundamental problem with this position is that it provides no explanation of how change to composites effects changes to its principles, specifically to its bearer of change principle, its substantial form. Therefore, despite the appeal of substance being considered as not necessarily unchanging, this position is rejected in favour substance being necessarily unchanging. The remainder of the chapter will seek to develop the compositional view of natural things, showing the how the bearer of change must be immaterial principle, and therefore

is not causally influenced by change, and that its capacity to undergo any change is due to its corresponding material principle.

3.1.3 Coordinated unity

Bringing together ideas developed in the above sections on immanent activity and classification, this final section on the hierarchy of the categories aims to show that at least for living things there is, in a real and irreducible sense, a single, immaterial and immanent coordinating principle of unity, which Aristotle refers to as primary substance. Furthermore, in the case of human beings, this principle, in addition to being distinguishable, is separable. Naturally, these claims considerably narrow down the range of compatable reponses to the mind-body problem.

The growth of a one-kilogram kitten to its mature adulthood of four kilograms involved consuming at least three kilograms of food. Three kilograms of non-cat became three kilograms of cat by being consumed. Cat-like operations that were not found in those three kilograms now manifest, as part of a whole, cat-like operations. Somehow, 'catness' had the capacity to take on and inhere in something else without its own corruption, unlike the quantity of whatever the food was before being consumed. Substance, then, appears to have a kind of dominion over quantity. Upon eating a mouse, a cat does not become a cat-mouse, but does become a greater cat (as in, having more quantity). The consumer subjects what it consumes not merely to conform to itself but to be an increase in itself. But, suppose the mouse was eaten, and then sometime a little later regurgitated. Did the cat lose some of itself in the act of regurgitation? Surely not. Until the food is subsumed into the immanent operations of the substance, the food retains its own integrity. Looking from other perspective, no living thing would readily sustain the removal of a significant portion of its 'quantity'; damage would be done.

Inhering in, then, has a certain strength of meaning, and it could be described as 'inhering into a coordinated unity'. The regurgitated mouse was never assumed into the coordinated unity of the cat. From this, there appears to be some meaningful sense that quantity is present in (or is taken on by, or inheres in) substance, but not vice versa. On the other hand, for an artefact, like a computer, one part of it could be swapped for another without any adverse consequences to the functioning of it.

Perhaps discussing the substance of catness or the like is more a convenience of communication rather than a recognition of a metaphysical reality. Is it really the case that there a single principle that governs all activities, or are there many 'principles' governing the various activities of living things? The possibility of more than one principle is plausible: both breathing and heartbeat are necessary activities of distinct bodily systems in the life of a mammal. Nevertheless, even these activities need to be coordinated and kept in parity, and so instead, the nervous system could be plausibly considered as the single coordinating principle. Despite this, the nervous system is not an independent coordinating principle, and so not a principle in the metaphysical sense. There is an interdependence between many, if not all, bodily systems. One system coordinates all

the signaling, another the supply of nutrition, and another the structural support, etc. Therefore, a plausible third answer is that there is, in fact, no coordinating principle but merely interdependent systems; the human person, for example, just is the systems that constitute it.

The consideration of the death of a living thing, I argue, provides a credible way for showing that there must be exactly one principle of coordination. There is a certain degree of mutilation that can be tolerated by an organism whilst not yielding to death. Blindness, deafness, loss of a limb, brain damage, etc, could all be described as mutilation. However, a local impairment to some particular bodily system, like a blood clot, could go on to corrupt the unity of the whole organism. When exactly the transition takes place from mutilation to corruption, however, seems not to fall under the enquiry of observation, indicating that there may be some kind of principle over and above the mere interdependence of bodily systems.

Attempting to associate death to some local change or other would undermine the very notion of being coordinated. Substantial change is across the whole substance, a loss in coordination of principles not change in some particular principle. This is not to imply that substantial change is somehow independent of local change, but rather that substantial change is not identical to a local change. Nevertheless, that the substantial change does take place becomes irrefutable. Loss of coordination of principles, then, rather than cessation of particular subordinated principles appears to be death as such. This does not rule out the possibility of a subordinated principle ceasing to operate being the main cause of death, but it is not death, rather only that which leads to it.

The process of death is somehow a local change effecting the metaphysical bond between it and a non-local coordinating principle. For a living thing, various kinds of mutilation, such as the loss of sight, hearing, limb, etc, diminish the capacity to move toward immanent ends, such as nutrition, growth, reproduction, etc, without destroying all immanent capacities. On the other hand, if the mutilation is to such a degree that no inherent ends remain achievable, there would no longer be a coordinated unity, since corresponding activity of that unity would be rendered impossible.

Attempting to positing a *material* account of a non-local coordinating principle of unity would suffer from a vicious regress, since it in turn would require some further principle of unity due to it being extended. The alternative is that the principle of unity is immaterial. Being immaterial, the principle can coherently be argued to be wholly in the parts that it unifies. The limbs of a human body are not not limbs of a partial human being but of the human being in an unqualified way. Every coordinated part of the human body fully belongs to the human substance. If the principle of unity were not wholly in all the parts it unified, partial mutilation of a substance would not be possible. The loss of a limb would necessarily mean the irrecoverable loss of part of the principle of unity, therefore diminishing in some way the essence of substance.

Being an immaterial principle does not, however, imply that it necessarily continues to

exist upon the corruption of the matter that it once informed and unified, though it does leave the possibility open. This possibility is employed with respect to the principle of unity in the human person. As noted in the introduction, it is the capacity for abstraction, an operation whose product, a concept, is immaterial, that distinguishes the immanent principle of rational beings from non-rational living things. The claim that the immanent principle of living things is immaterial is simply an exposition that at least living things are bearers of change. To ask 'where is the bearer of change?' could only be answered by pointing to the living thing. But, what happens to the bearer of change when the living thing dies depends on the operations of the bearer of change. For rational bearers of change, there could be no such possibility of total mutilation, insofar as mutilation is to be understood as the impairment of a faculty from achieving its immanent operation. Damage to the eyes would mutilate vision, but what damage, or what change, could occur that would mutilate the power of abstraction to produce concepts? Seemingly no material change could produce such an effect. For non-rational bearers of change, however, every immanent operation could be impaired by impairing the least dependent operations, like nutrition.

3.2 'Present in'

In the previous chapter, any kind of change was shown to need some bearer of change, a principle that persists though a given change, and this principle was argued to be more fundamental than the change undergone. In this chapter the relationship between change and bearer of change has been examined with respect to substance and accidents of living things, whereby the bearer of change has been argued to be an irreducible immaterial principle. In both stages the notion of 'present in' has been used in the two contexts: implicitly in the context of potency being dependent on act, and explicitly in the context of quantity (or quality, etc) being present in substance. If substance and accidents are terms that relate to potency and act for at least living things then the manner in which they relate needs to be established. Potency being dependent on act could be formulated as potency being present in act. Defending this same kind of relationship would offer parsimony of metaphysical principles, from principles of composition for all changeable reality to principles of composition for changeable living things. Therefore, how 'present in' is to be understood needs to be examined to determine if there is indeed parsimony among the relationships of metaphysical principles so far presented. Since the explicit use of 'present in' was with respect to substance and accidents, this will be taken as the primary sense. The task is to examine in what sense the notion of present in as understood for accidents present in substance can be applied to potency present in act. Possible interpretations could either equivocal, univocal or analogical, and these will be examined in turn.

For the equivocal sense of potency present in act, this would mean that potency being present in act is in no sense like accidents being present in substance, despite potency

being dependent on act. In the case of accidents, their existence requires a bearer. Four kilograms does not exist in its own right but a four kilogram cat may do. Some accidents, moreover, whilst are only present in does not imply some accidents are not essential. A cat being four kilograms is accidental and is also not essential for being a cat; it could be three kilograms and still be a cat. On the other hand, the human capacity to produce concepts by the power of abstraction is a capacity present in humans and is essential; to not have the capacity whatsoever would not to be human, namely to be a Homo *sapien*. Accidents, then, are present in substance insofar as at most providing its essential capacities. More typically, however, accidents facilitate a range of possibilities within a particular substance. Human being has a range of being male or female. The sex is present in human nature, and being sexed is essential for the kind, but being sexed has a possible range, male or female, for the particular. For potency to be present in act but no sense like accidents present in substance would mean that the dependency of potency on act is not a real dependency, i.e. potency can exist without act, and potency does not provide a range of possibilities for actualisation. Arguing an equivocal interpretation of potency present in act with respect to accidents present in substance would be tenuous. As argued already, potency does indeed provide a range of real possibilities, otherwise persistence through change would be inexplicable. Secondly, the ontological priority of act has also already been argued for, making the relationship between potency and act a real dependency. Therefore, it appears to be false that potency is in act in an equivocal sense to accidents being in substance.

The univocal sense of potency being present in act would mean that potency is present in act in just the same way that accidents are present in substance. This would be the ideal case for the argument from parsimony, providing a single kind of relationship, 'present in', which is true for potency and act and also true for accidents and substance. If the relationship were to be the case it would imply that there were a variety of potencies and grades of relevance of potencies with respect to act, just like there are essential and non-essential accidents, and just like there are varieties of accidents, such as quantity, quality, relation, etc. Potency, however, has in no sense a relationship to act like essential accidents have to substance. If there is no such capacity of abstraction in a substance then the substance cannot be human. However, such a formula does not appear to apply to potency and act. 'Is there a potency, x, such that if it were absent then some particular act could not be y?' is a nonsensical question as there is in no sense a multiplicity of kinds of act, rather there is only act multiplied in potencies. Therefore a univocal understanding also appears to be false.

The third way of interpreting 'present in' is the analogical way. This interpretation implies that there is a significant similarity of meaning between the use of present in used in the context of act and potency and substance and accidents but that there are also differences which need expounding. With respect to similarities, both potency and accidents are dependent on act and substance, respectively, and both potency and accidents

depend on act and substance for their existence, respectively. These two reasons establish the significant similarity of meaning between 'present in' for both potency and act and accidents and substance. However, there are a number of differences. A first sense of difference in the analogy is that a subject is revealed by its predicates but potency does not directly reveal act. Consider the slight differences between Felis lybica and Felis catus: careful examination is required of the predicates in order to conclude that they are different species, not the other way around. Nevertheless, any given cat is known to be such intuitively, without any recourse to laborious argumentation. At best, this is not the case with act; to posit a claim for its real existence requires rational discourse - in other words, it is not directly knowable. A second sense of difference in the analogy is that whilst accidents depend upon their existence by the substance, the dependency is derived rather than immediate, or primary, unlike the existence of potency upon act. Upon the death of a four kilogram cat, there are still for kilograms of something, even if it is no longer a cat, so whilst four kilograms do not exist in its own right, it does have a strength of existence that may persist despite the loss of its original substantial bearer. Potency, on the other hand, just is the fundamental principle of change. Being the principle of all possible change, there cannot be, by definition, a persistence of potency in any sense in the absence of act. Finally, a third sense is that change in predicates may destroy a subject, the principle of stability, such as the death of a cat due to a sudden loss in a critical amount of quantity, whereas change in potencies would have no consequence to act, indeed annihilation of all changeable things would be inconsequential to act by definition. Stating this in another way, potency depends on act but not vice versa. The predicates of subjects depend on its substance, but despite the priority of this dependence there is real cooperation or interdependence. Therefore, it would appear to be reasonable to associate potency to act and accidents to substance by the same relation of 'present in', but its interpretation needs to be analogous in order to preserve the real differences between the metaphysical principles. This lack of univocal parsimony in some way reflects the development from fundamental principles true of all changeable beings, namely being compositions of potency and act, to what is true of things as complex as living beings. It is not surprising, then, that univocal parsimony is not preserved.

3.3 Returning to potency and act

The overall argument has examined two stages. The first stage examined whether or not change is a real phenomenon and concluded that it is, but change is not continuous in every way for all things. For change to occur, there needs to be some principle of change. Potency and act were the two principles introduced to account for the reality of change. The notion of bearer of change explained the very existence of things, here and now. This notion was developed by showing how the mind must also be a bearer of change since it has the capacity to develop a rational argument. However, such a limited sense of bearer of change, without further development, would serve little use for narrowing down

on responses to specialised questions in philosophy, like the mind-body problem. That change is real, and it can be accounted for by principles of potency and act do not, at least in any obvious way, rule out any of the theories on the mind-body problem considered earlier.

In this chapter, an attempt has been made to develop the notion of bearer of change in order to discern whether or not change, outside the activity of the human mind, is effectively atomic. If it is, then there is no reason to posit hylemorphic composition as a response to the mind-body problem as it would claim too much. Substance dualism, on the other hand, may be a better fit since the mind is what is irreducibly different, a bearer of change beyond simply existing here and now, unlike the rest which is matter. Property dualism may also be a reasonable candidate, since to associate a non-trivial bearer of change with a property rather than an irreducible principle has not yet been ruled out. Physicalism and panspychism could less readily be admitted. These two positions do not appear to require a notion of bearer of change, but as has been seen, it is needed to at least account for the motion of the human intellect.

To progress the case of hylemorphic composition as an account of change in material things, the scope of bearer of change has been widened to not only include the human intellect but also to include living things. This development has sought to deny that change is not atomic for living things but rather is governed by a bearer of change, namely, substance. Furthermore, an analogy to change taking place in a bearer of change has been presented, whereby accidents are 'present in' substances, with the former admitting variations without necessarily corrupting the subject. This argument, however, does not suffice to claim hylemorphic composition as a preferential theory, as this theory claims that bearer of change is found in all material things in a non-atomic way, not just living things.

The final chapter will advance the need for positing hylemorphic composition for all material things by arguing that a principle of individuation is required for particularising kinds of things. With the hylemorphic view then presented, various criticisms of the position will be examined and responded to.

4 Composition

In Chapter 3, the case was made for affirming the reality of a single bearer of change, the substance, which supports and provides the coordinated unity among accidental changes of a subject. Such subjects at least include living organisms. Both the substance and the accidents in a given subject were argued to be irreducibly distinct metaphysical principles, hierarchically ordered according to accidents being dependent on substance for their existence. This position broadened the conclusion from Chapter 2, where at least the human intellect, a faculty capable of change, was shown to be in some way dependent upon a bearer of change, therefore denying the standard positions of both Heraclitus and Parmenides, that everything changes and nothing changes, respectively. So far, then, composition in change has been shown to be a metaphysical reality, though not necessarily extending beyond living organisms and not necessarily hylemorphic in nature.

At this stage the two strong contemporary positions which are compatible with the argument are non-Cartesian substance dualism (NCSD) of Lowe and hylemorphic composition of Oderberg and Feser. Property dualism, panspychism and physicalism, due to their failure to provide any irreducible principle that could somehow account for persistence through change are considered to be in principle incompatible with the conclusions developed already.

The third and final stage of developing the argument for composition in change is to affirm its reality in non-living things, thus affirming that composition is a feature of at least all material things. This step aims to rule out NCSD, leaving hylemorphic composition as the most credible metaphysical account of the phenomena of change in the physical world.

The argument for affirming the compositional nature of non-living things will not further elaborate considerations about change but rather it will focus on individuation of kinds of things. This approach puts to one side whether or not real essentialism is pervasive throughout all material things, not just living things, since arguing this position becomes less persuasive as materially simpler things are considered. Instead, the position that real essentialism does pervade all material things will simply be asserted, insofar as all kinds of things at least tend towards some range of outcomes rather than others, indicating some minimal degree of operations and therefore some minimal degree of being bearers of change.

With respect to the mind-body problem, concluding in favour of the position of hylemorphic composition, in contrast to NCSD, entails that the fundamental principle which

is the bearer of identity, or 'self' to use Lowe's terminology, is not an novel principle for beings which have a 'self' but rather is a principle found in all changeable things, but bearing powers, or faculties, proper to the kinds of things that they are. From the mind-body point of view alone, hylemorphic composition could readily be seen as a mere difference in emphasis compared to NCSD; the former adds faculties to substantial form whereas the latter adds substantial unity to actions directed by a principle of self. Deciding between the two positions solely from the perspective of the mind-body problem would be very difficult. Widening the metaphysical scope, however, to examine the experience of change breaks the deadlock, as argued here, because the the single theory of hylemorphic composition is adequate for both change and the mind-body problem. NCSD, on the other hand, does not appear to have the necessary irreducible principles to accommodate change, at least for organisms that lack selves.

4.1 Individuation

Change has been the starting point of the enquiry into composition. After this, substance and accidents have been described to develop the notion of persistence through change in living things. The task now is to determine whether or not there are further principles which need to be posited in order to account for individuation of things of the same kind, and if so, how do they relate to the principles established already.

At first, there is no obvious reason why further principles need to be posited to account for individuation, over and above the substance and accidents categories already presented. Substance is described as 'not present in', implying a notion of something self-contained and individuated. Furthermore, quantity is presented as one of the accidents, something present in the subject. It is quantity that divides parts from whole; without quantity there can be no parts and therefore no extension. This, however, is not considered adequate by Aristotle and his commentators, principally Aquinas: accidents present in a substance is too general to resolve material individuation. (Domínguez et al. 1991: 103, Klima 2019: 11)

The inadequacy of the Categories as can be seen by considering the essence of things. Rational animal is the logical essence of humanity; it presents the proximate genus and specific difference. But no human person is only its logical essence. To be a particular human person is to belong to that kind *and* to be materially existent.[1] The physical essence includes, therefore, that it is a materially extended rational animal. However, to posit the accident of quantity as that which individuates the essence would conflate the sense of accidents being 'present in' substance, and the sense of substance being an

[1]'[T]he definition [of what something is] expresses the *essence*. The essence is not the form. Where there is a form-matter compound, the essence is expressed by the definition of that compound in terms of its form and matter *in combination*. [...] This might make one wonder how an Aristotelian can even separate form from matter so as to be able to say *what* the formal component is. The answer is that in a sense he cannot. It is not as though the form can be held up for inspection independently of the matter and then given its *own* definition.' (Oderberg 2014: 167–68)

individual particular. Accidents simply make for the possibility of change in something but are not themselves the bearer of those changes.

To propose that the accident of quantity is that by which something is an individual would be to make a material subject dependent on an accidental category, creating a circular dependency. In Chapter 2, change and bearer of change were shown not to be equally fundamental principles, but on the contrary priority must be given to the bearer of change over any given actual change. Being quantified is dependent on being something, rather like the priority of there being a cat of four kilograms not four kilograms of cat-like quantity; the weight can change without corruption of the substance.

Quantity gives a subject a specific, or determined, extension at any given point in time. What quantity does not provide is the principle by which quantity is received in a subject in the first place. A principle, therefore, that determines that something has quantity is needed. This principle needs to be such that the original matter when the subject is composed does not need to persist throughout the persistence of the substance, but, nevertheless, some quantity must still make up the subject at any given time. The accident of quantity provides extension, here-and-now, and its variation, but something needs to account for the fact of being quantified in the first place. To illustrate this difference: in order to possess the concept of triangularity, a recipient must be capable of educing from examples of triangles the concept of triangularity. A person merely having the concept of triangularity *would not also* explain the capacity to receive the concept in the first place. A similar arrangement appears to be the case for individuated kinds of things: quantity, like triangularity, is received, but not just by anything. Cats and dogs do not receive the concept of triangularity, just like angels do not receive quantity; rather, only those kinds which have the capacity to receive quantity may do so.

Some principle for individuating the essence of a subject is needed which has the characteristic of neither being a substance nor an accident. The principle cannot be identical to the substance since, in principle, the individuating matter can entirely change without the substance corrupting, and it cannot be identical to an accident since this would make substance dependent on an accident.

The principle of individuation must be indeterminate, since accidents already are determinate with respect to degree, and essence is determinate with respect to operations. A principle of the requisite kind could not be admitted by potency-act composition since there is no composition in a principle devoid of being anything particular. Potency, alone, however, could satisfy the characteristics of this required principle of individuation. Potency, as described earlier, has three principle characteristics. It cannot exist in its own right but rather it is present in act; it limits act to some particular kind; and finally, it is the principle of change. Of these three characteristics, it is the first which supplies the requirement of an individuating principle. The principle of individuation is the account of potency in its least differentiated manner, and represents the extreme opposite end of the ontological spectrum from pure act. This kind of principle is referred to as prime

matter, a principle that is not obviously admitted by Aristotle, but is explicitly admitted by Aquinas.

It is tempting to conflate prime matter with matter, stuff or quantity, but this would be a mistake. Prime matter, as least differentiated potency, and therefore radically undetermined, is only a real principle but is in no way actual. The sense of it being real conveys that prime matter is causally relevant (unlike numbers or unicorns), whereas the sense of it not being actual conveys that it is only causally receptive (unlike an agent of change). As yet, it is not delimited or identifiable or quantified. Nevertheless, it is this principle by which the essence of a kind of thing is particularised in the natural world. Prime matter, however, must be composed with another principle to bring about real existence here-and-now, a principle that is actual to some degree. Given that the essence of natural things is described in the particular, already bearing the principle of individuation, that which receives prime matter and individuates essence requires its own term. 'Substantial form' is typically used to describe the principle that receives prime matter and establishes the coordinating unity of the composition.

Aquinas offers an account of prime matter and substantial form, indicating why they are principles in themselves, and also principles of composition:

> We should note that prime matter, and even form, are neither generated nor corrupted, inasmuch as every generation is from something to something. That from which generation arises is matter; that to which it proceeds is form. If, therefore, matter and form were generated, there would have to be a matter of matter and a form of form ad infinitum. Hence, properly speaking, only composites are generated. (DPN 2.15)

The argument for the individuation of kinds into particular instances associates a principle of indetermination, prime matter, with a principle of determination, quantity, whereby quantitative determination is an act of the substantial form. This general structure of associated principles does, however, appear to be vulnerable to a critique when considering the individuation of 'separated souls' upon death. The following two premises appears to lead to a conclusion which is incompatible with hylemorphic compostion:

1. the quality of intellectual character varies from person to person;
2. the subsistent faculties of the human person which are not intrinsically bound to matter are argued to persist upon death.[2]
3. quality, at least with respect to the intellect, is an individuating principle.

If quality, with respect to the intellect, is also a principle of individuation of post-mortem subsistent faculties then it should also be a principle of individuation in the single substance of the whole human person. This, however, would imply that there are

[2]For the immateriality of the intellect, see Feser 2006: 219–28 and Oderberg 2005

two principles of individuation, introducing an apparent contradiction into the sense of unity of the single substance that hylemorphic composition insists upon. Comparing the post-mortem human soul as being in some way analogous with angels would be mistaken. Angelic kinds have no individuation; they are exhaustively their own kind. For angels, it is essence that individuates. *Homo sapien*, however, does not individuate; rather, *it* is individuated.

To respond to this dilemma, some way of showing that quality cannot be a principle of individuation is needed. This could be done by appealing to the earlier argument that, like quantity, quality cannot be a principle of individuation since it is already dependent on substance. This line of argument does not so clearly work, though, since post-mortem subsistent faculties are not substances, according to the hylemorphic position. The critique appears to have some weight and so is noted, though since hylemorphic composition does not necessarily entail the immortality of the human soul, the critique does not demand the reworking of the theory of individuation.

At this point, a full ontology is proposed that affirms the central claim of the thesis: potency-act composition describes change in general, substance-accidents composition describes natural kinds of things that undergo change whereby there is a single principle of unity, the bearer of change, and a multiplicity of possible kinds of changes, and finally, prime matter-substantial form describes the individuation of kinds of things. In each stage of compositional principles there is a narrowing of applicability: all reality falls under act or potency-act composition; all changeable reality falls under substance-accidents; and all material reality falls under prime matter-substantial form. Composition is found in all reality that undergoes change, and for material kinds of things, this kind of composition is argued to be hylemorphic.

The second part of this chapter will present and respond to the position of non-Cartesian substance dualism, since it represents the principle alternative to hylemorphic composition. This position will primarily be presented through the work of Howard Robinson, who, whilst not explicitly taking the position of NCSD, accepts the Aristotelian dualism of the intellect being immaterial but rejects pervasive Aristotelian hylemorphic composition, especially in non-living organisms. The explicit position of NCSD will be presented through the work of E. J. Lowe. Since Lowe, however, does not contrast his position with hylemorphic composition but rather the position of physicalism developed by David Papineau, this latter position will be presented to provide sufficient context.

4.2 Physicalism

Physicalism affirms that natural phenomena are ultimately accounted for in the details of the physical interactions of fundamental physical phenomena. All physical effects are brought about by physical efficient causes, so there is no room for other causes without implausible systematic overdetermination. Papineau argues that there is a strong case for 'closure under physics', and this serves as the foundation of the physicalist position. (Pa-

pineau 2001, Papineau 2002) Robinson argues that closure under physics and hylemorphic composition cannot be reconciled. (Robinson 2014)

For the physicalist, all material things behave according to physical laws, of which two are given special attention. According the laws of conservation of momentum and energy, the domain of possible causes that can influence material things is closed, thereby excluding metaphysical principles that cannot be subject to detection and measurement. One candidate for exclusion is substantial form. The hylemorphic position argues that substantial form is a real, immaterial principle, fully in every part of the matter it informs, and the cause of coordinated unity of the substance. But, positing such a principle, for the physicalist, is untenable, since causal influence is already closed off to non-detectable influences, so it is impossible for an immaterial principle to be a source or sink of momentum or energy to a material thing. For example, it is not possible, according to these laws, for some 'coordinating unity' to coordinate the activity of raising one's arm because to trigger the event of raising one's arm by a coordinating unity would have to introduce a momentum or energy contribution in order to influence the bodily action. By introducing such a contribution, however, momentum or energy will not be conserved.

Furthermore, science, especially physics, appears to reveal a 'bottom up' description of nature, whereby the macroscopic structures and behaviours can be recast in terms of microscopic phenomena. This view appears to go against the hylemorphic position whereby the fullest sense of what something is lies at the substantial level, which may well be macroscopic, and it is the substantial form that properly governs, or at least constrains, lower activities, in somewhat of a 'top down' fashion. For the physicalist, ice forms not because 'ice form' comes along and turns water into ice but because at the atomic scale the hydrogen atoms lock together in a pattern that forms a crystal. What is seen at the larger scale is explained scientifically at the smaller scale. 'Form', for the physicalist, is simply a pre-scientific account of nature.

Physicalism has become a plausible philosophical position since the mid twentieth century due to advances in the natural sciences describing conservation laws which appear to assert that any physical effect must have a sufficient physical cause. For Papineau, physicalism can be argued in three stages:

1. all physical effects are fully determined by law by a purely physical or prior history;

2. all mental occurrences have physical effects;

3. physical effects of mental causes are not all overdetermined.

The conclusion he draws from these premises is that mental occurrences must be identical with physical occurrences. (Papineau 2001: 6)

The causal closure argument has appeal. By its scientifically backed empirical claim, the argument provides a way of dismissing non-physical ontological principles, such as substantial form, since any causal influence from these principles would violate of the conservation laws. Whilst the argument does not deny the possible reality of non-physical

principles, what it does do is remove such principles from contact with the natural world. Alternatively, it may permit metaphysical principles, but *only as explanations* rather than as real. An example of this would be to consider the four causes of Aristotle as merely a way of describing a state of affairs for the sake of convenience, whilst acknowledging that the reality nothing more than conservatively governed physical activity.

The grounding for the first stage of the argument for physicalism appears, however, to overlook the implications of the second law of Thermodynamics. This law describes how closed systems will tend to a uniform energy state, a state of maximised entropy, in the absence of any work being done on the system. Considering this law against the reality of living organisms, how do such local low entropy states exist (namely, the living organisms), despite the universal empirical law stating that entropy will increase, but for external work done? The straightforward response to this objection is that the locally low entropy states persist because they do indeed consume energy to maintain such a state. Animals eat and this energy is absorbed and gives off heat and as such they too are net contributors to increasing the overall entropy. A second response is that local entropy reduction is argued to occur in nature anyway, so the phenomena of living things may not exhibit any special features. Hawking radiation emitted from a black hole is claimed, by Sir Roger Penrose, to be an example of this. Nevertheless, the death of a living thing is unlike the decay of a black hole; the former leads to a sharp rise in entropy without any clear-cut physical cause, whereas the black hole decays gradually *because* it emits Hawking radiation.

It seems incumbent upon the physicalist to account for, within the domain of physical closure, the change from a coordinated unity in a state of relatively low entropy to an uncoordinated body of matter rapidly bringing about mutual decay and effective rise entropy. Death has both an empirical aspect and a non-physical aspect. It is empirical insofar as being able to tell when something is alive and when it is dead. The flattened fox on the road is dead, the cow in the field is alive, and these are common sense observations. The non-physical aspect is when the living organism actually dies. As Oderberg argues, this is a metaphysical change whereby the matter can no longer support the substantial form, as oppose to something that can be narrowed down to a specific change in a physical state of affairs. (Oderberg 2017) The moment of death lacks sufficient material identification, and this is not for want of trying to propose candidates.

Attempts to associate death with a particular organ failure, such as the brain, have counter-examples, as Oderberg discusses. Death, as he argues, is fundamentally qualitative in nature and is better understood as a process rather than an all or nothing point in time change, a process of mutilation (an increasing loss of coordinated unity) of members of the organism until the principle of life can no longer be sustained. It may still be maintained by the position of physicalism that a thorough account of death is simply pending further investigation, rather than death being in principle outside the enquiry of science. However, this position lacks the grounding of being able to posit a material

hypothesis for death, being able to conceive of what death might be, in a material sense, in order to examine possible candidates for its cause. This is not to be confused with what contributes to the process of radical mutilation. Obviously, incidental mutilation contributes to this final change, but nevertheless, the activity of change is not what is being sought, rather loss of being of a particular nature, or the outcome of change, is the matter of concern.

A second concern about the first stage of the the argument for physical closure is that necessity is implied by the conservation laws. Anscombe challenges the claim that there is a necessary connection concerning causation, that some event always follows such antecedents. A common position is that there is a relevant difference 'if an effect in one case and a similar effect does not occur in an apparently similar case'.[3] However, she argues that what are necessary are laws of nature and from them we can obtain knowledge of effects from knowledge of causes, but such laws do not show us the causes as sources of the effects. Causation is the domain of the particular, whereas law is the domain of the exceptionless generalisation. Attempting to transition from the general exceptionless law to the particular whilst maintaining the quality of being exceptionless is an additional fact which, to her, lacks justification. When effects derive from causes, with examination we come to know what the sufficient, or normal, conditions are for the effects to follow. But sufficient or normal conditions is a vague notion: sufficient is very much like 'enough', that there are enough conditions for the expected effects to come about, but such notions do not commit out of necessity that they do.

There is at least some common ground between what is observed at the scientific level and what is affirmed at the metaphysical level, following the hylemorphic account. What makes something transform either accidentally or substantially, is the efficient cause.

> According to our manner of knowing, the efficient cause is the first one we call cause: it is the one we usually refer to when talking about causes. [...] [I]t is the one that properly acts, and it acts by determining the material cause through the formal cause. The material and formal cause do not act: they cause each other. It is the efficient cause that acts. (Torre 1981: 108–11)

Not surprisingly, the scientific account of change is in keeping with the metaphysical account, but nevertheless, it is not the same account. The scientific account concerns itself with those aspects of being which can be measured, namely quantity, and those aspects that can be measured in relation to others, such as action, location and time. The scientific approach does indeed have a view on reality, but it is only certain accidental realities, not the whole scope of accidents, especially quality and relation, and certainly not substance.

The hylemorphic approach seems to agree with Anscombe's objection to necessity being an assumed condition of causality. How can necessity be drawn out of contingent

[3]Aristotle, Spinoza, Hobbes, Kant, Mill, as quoted by Anscombe, qualify their account of causation with necessity. (Anscombe 1993)

beings in the first place? The principle of non-contradiction may be argued to be an exemplar: it is a fundamental notion about things in the world, that something cannot be and not be in the same manner. However, causality concerns *transformation* of being, not principles of being. Causality follows from being but not vice versa, so for contingent beings, necessary causality cannot follow in principle.

In an indirect way, Anscombe is affirming the hylemorphic position that in the primary sense what is real is being, not becoming. In separating out the understanding of something being caused and something being determined into the former having taken place and the latter yet to happen, she argues that what is yet to happen cannot have the status of necessity attributed to it, as in having the initial conditions plus the principle of necessity in causes, entails something as being determined. This she rejects. In what sense can it be said that the path of a ball through a Galton board is determined? Attempting to work backwards from the final state of a ball in a particular bucket to how it arrived there from the initial state of it dropping into the grid of pegs rapidly becomes a futile task as compound error would swamp such a calculation. What can be accounted for rationally is that the ball did fall into a particular bucket and simulations on a computer can mimic the same activity. Instead, the assumption that causes can be traced back from actual events unambiguously, or rather, determinedly, is an illusion, Anscombe claims. Attempting to track upstream to the causes of events is asymmetric in the kind of knowledge received from advancing forward through events. The former is at best statistical whereas the latter can be described in the fashion of universal laws.

The approach of Anscombe to associate causation to particulars and determination to laws opens up some room to question the conclusion of the inadmissibility of causal overdetermination by the physicalist. That something may be overdetermined according to physical laws does not necessarily imply that it is 'overcaused' in the particular things that generally behave according to such laws, particularly in the interaction between the mind and the body.

A third response to physicalism is offered by Lowe, who argues that some form of ontological dualism is compatible with even the strongest forms of closure under physics. He argues that no matter which variation on the definition of the first premise is used (variations on: 'all physical effects are fully determined by law by a purely physical or prior history'), the anti-dualism conclusion that 'mental occurrences must be identical with physical occurrences' cannot be affirmed. Too strong a first premise would render the third premise (physical effects of mental causes are not all overdetermined) redundant, thus leaving a two premise argument with the second (all mental occurrences have physical effects) agreed by dualists. Drawing the conclusion that some mental events are physical events from such an argument would not hold, however, since it would not be accepted by the dualist. Too weak a first premise would run the risk of it leading to invalid conclusions in arguments it is deployed. (Lowe 2000: 575) From the point of view of the physical scientist,

> the mental event would be invisible to him [...], his explanation would be [...] incomplete and would falsely represent the occurrence of [a physical outcome] as being coincidental [with a mental antecedent]. (Lowe 2000: 581)

Instead, Lowe's own suggestion is that

> The world of [mental and physical events being inter-causal] may in fact be our world. If it is our world, physical science can present us with the semblance of a complete explanation of our bodily movements, and yet it will leave something out, giving our bodily movements the appearance of events in our brains and nervous systems. But isn't that precisely what current physical science does appear to do? As it traces back the maze of antecedent neural events, it seems to lose sight of any unifying factor explaining why those apparently independent causal chains of neural events should have converged upon the bodily movements in question. In short, it leaves us with a 'binding' problem associated with conscious perceptual experience. (Lowe 2000: 581)

Lowe also considers the nature of energy too opaque to delimit the manner by which contributions or losses are made in its overall conservation. If energy is a physical quantity then the closure argument becomes merely verbal since conservation of energy is appealed to as grounding the first premise. Given the openness of the ontological nature of energy, kinds of energy could be postulated that are convertible into physical energy in accordance with conservation laws. (Lowe 2000: 571)

Finally, Lowe argues that if there is no such thing as self, 'a persisting entity an bearer of properties', then it is not clear how simple things, like moving one's arm, can be explained. Ordinarily, upon deciding to move one's arm, the arm moves. At the chemical/biological level, when tracing the outcome back to its causes, there is no correspondence between the single decision at some point in time and the single act of moving one's arm compared to the single outcome of the arm moving and the tracing back of physical contributors to it, which become more and more numerous and diverse the further back in the process we go. So, physically, there are many diverse and contributing inputs to the movement of my arm, but in intention there is only one. Therefore, there must be some immaterial principle which at least coordinates the body's movements.

4.3 Top-down causation

Although Lowe rejects a purely physicalist view, this rejection does not obviously extend to things that do not, for him, possess the dual principles of 'self' and 'body'. Where the line lies is not clear, perhaps including both sentient and rational animals or perhaps just the latter. Regardless, for non-sentient living things and all non-living things, Lowe's position may reduce to that of physicalism. Robinson argues that the kind of position Lowe adopts is preferable than a hylemorphic view, even if the hylemorphic position can accommodate the requirements that Lowe sees as needing to be fulfilled for the self-body

duality. The problem with hylemorphism, for Robinson, is that principles of substantial form and final causation (teleology) persist even in the absence of rationality.

How can closure under physics, an approach which seeks to explain the reality of things from fundamental components, be reconciled with hylemorphic composition, an ontological account of reality whereby parts are composed into a unified and coordinated whole by a 'top down' principle, namely, substantial form? Robinson argues that a realist hylemorphism cannot be reconciled with closure under physics since

1. all physical forces operate at the bottom level, so higher causes, such as structure or unity, are not ontological causes but explanatory schemes;

2. if high causes are in some way real, they are not part of the world they explain but only really part of the conceptual structure we apply;

3. the autonomy of structure points to a conceptualist interpretation of them.

Robinson asserts that it is specifically the commitment to an irreducible teleology which prevents reconciliation of physical closure with a realist and substantive hylemorphism. To illustrate his scepticism about substantial form, he compares a the causal cohesion of an oak tree and the dynamic interaction of swarming insects and argues that the manifest particulate nature of the latter is merely a difference of complexity and degree compared to the former. 'One might put it this way: an object does not need to be something over and above what constitutes it to be real; if its constituents are real, so ipso facto it is.' (Robinson 2014: 208)

Robinson's primary reason is that he thinks that formal and final causes are only worth positing if they make a difference to the distribution and motion of matter, compared to what one would expect from the efficient and material causes, and that this is inconsistent with modern science. Modern science, he argues, tells us that the physical world is causally closed; that all physical effects can be fully explained by prior, efficient physical causes. Given this is the case, formal and final causes described by Aristotle, are redundant.

If the hylemorphic position were affirmed, substantial form would dominate the understanding of things that have no obvious sense of substance. Robinson makes use of the phrase 'distribution and motion of matter' in order to emphasise what he regards as the pathological case for hylemoprhic composition. Hylemorphic composition appears to wish to assert form on everything, giving everything some 'top-down' power which governs how it behaves. This position, however, is simply not the view which the sciences, especially physics, conveys. The search for scientific explanation tends to advance by understanding the characteristics of components, rather than wider environments.

Hylomorphism, Robinson contends, simply does not fit nature as is now understood. The incompatibility of the four causes with closure under physics is that there is no such separation between the material and efficient causes being the domain of the natural sciences and the totality of the four causes, material and efficient, along with formal and final, for the domain of everything else, such as the mind-body problem. This incapacity

to partition the causes is due to affirming hylemorphism, since it brings form into the ontological account everything, since it permeates the whole of material nature. If form does play a role, and so vindicate the Aristotelian position, Robinson insists that '[its] relevance here can only be that form plays an essential role in making the matter do what it does', as a top-down controlling influence on matter rather than something that merely explains why there is an organisation present in the first place.

> There is a view current that there exists entities that are real but not fundamental, and perhaps substantial form falls into this category. But in so far as these entities make no difference to the location or movement of matter I do not see how they can occupy the foundational position that Aristotle attributes to substantial form. [...] Aristotle's substantial forms or essences [...] supposedly possess a metaphysical unity no plausible account of which seems to be available. [...] [I]t is hard to see what the reality of such forms consist if they are not just convenient explanatory categories and yet do not count as efficient causes. (Robinson 2018: 5)

Robinson considers modern interpretations of substantial form, principally the 'rescue act [of] understanding [it] as structure or organisation'. But he rejects this interpretation since structure is a by-product of the interaction of parts rather than the cause of unity. For example, the path a river takes is not simply a consequence of the dynamic structures in the flow of the water, but also of the relatively static structure river banks that bound its course. Since the two structures do interact and influence each other, structure cannot be understood in an analogous way to substantial form, namely, a single coordinating principle. On this point Oderberg agrees with Robinson that 'structures in general are too prolific and overlapping to do the job of individuating objects that form is made to do'. (Robinson 2018: 7)

> Form has an irreducibly qualitative aspect, *supplementing its quantitative aspects* which can usefully be called structure, or better still, structural features. Taken together —taken holistically— we get a picture of the form of a substance. (Oderberg 2014: 178)[4]

Feser appears to undercut the central issue Robinson may have with respect to hylemorphic composition by arguing that hylemorphic composition of matter and form makes, at the level of mere distribution and motion of matter, a minimal and scientifically non-invasive claim.

> Note that any determining, actualising pattern counts as a 'form' [...]. Being blue, being hot, being soft, etc. are all forms in the relevant sense. Note also that 'matter' is not meant here in the same sense in which it is used in modern science — though hylemorphism is not in competition with modern science, just as [...]

[4]Emphasis added.

> the notion of active potencies or causal powers is not in competition with modern science. (Feser 2014: 161)

The argument he puts forward is that matter understood metaphysically and matter understood scientifically are not being placed at the same level of reality, but rather being placed hierarchically. So, whilst talk of causes and hylemorphism at the scientific level may seem unjustified, at the metaphyiscal level it is necessary.

> Whatever chemists tell us about the chemistry of ink, and whatever physicists tell us about the nature of matter more generally, change presupposes 'matter' in the sense of a determinable substratum of potency. For the purposes of science, that, like the notion of a causal power, is ontologically minimally informative. (Feser 2014: 161)

Robinson simply asks what way, causally, does form have anything to do with the distribution and motion of matter? Surely it is enough to claim that there is something, called matter, whereby disturbances in one portion of it at least locally effect other portions in a general, describable way, and that the fact the this happens is termed efficient causation. Form, according to Feser, is an 'intrinsic principle by which a thing exhibits whatever permanence, perfection, and identity'. (2014: 162) But this is regarded as irrelevant by Robinson, since the mere distribution and motion of matter does not have any obvious sense of permanence, perfection or identity.

If hylemorphic accounts of even the simplest scenarios of mere distribution and motion of matter must be appealed to, then this necessarily rules out any bottom-up description of matter, which is the prevailing description from the natural sciences. So, is hylemorphism really top-down, in so far as any account of matter must make an appeal to some causal reality which is outside the domain that falls under examination of the natural sciences?

Consider the example of radioactive decay of an atomic nucleus: particles or radiation are emitted from an unstable nucleus in a stochastic process, i.e. one that is random but can be analysed statistically. Such a scenario fulfils Robinson's state of affairs under examination, the distribution and motion of matter. Can the very description, however, be arrived at in the absence of at least an implied ontological form and finality? Words that need grounding are 'decay', 'unstable' and 'random', whilst avoiding appeal to anything ontologically beyond matter and efficient change, if Robinson's position is to hold force.

To decay is to break down from something that has greater being (or unity) to some things that, therefore, have a lesser degree of being. To state this of any decaying thing, though, is to acknowledge the initial undecayed state had, in some minimal sense, a unity. Likewise, to be unstable indicates activity, and in this case, towards reaching stability, conveying, again at least minimally, a directedness toward some end, in this case a stable isotope. Finally, something is random, not in its own right but relative to some activity that is systematic or regular. If there is randomness as such then efficient causality is incapable of accounting for its existence, implying there is some other irreducible principle

in act. It is not obvious how the other classical causes could account for the phenomena of random activity, but nevertheless, positing randomness appears to not fit into a mere material-efficient ontology.[5]

Following the themes of stability and randomness, a readily reproducible mechanical problem, the double pendulum, provides a second example. By introducing a simple modification to a regular pendulum of adding a mid-point pivot, the behaviour of its motion changes from non-linear to chaotic. What starts out as a problem with one degree of freedom (the regular pendulum) having readily predictable behaviour relative to the initial angle the swing of the pendulum starts at, a radical change takes place with simply introducing an extra degree of freedom, such that now the behaviour of the pendulum becomes very difficult to predict from the initial angle of its swing. So, if efficient causality is the exclusive account of activity, how does anything but trivial unities behave in stable ways? This simple example highlights an important characteristic broadly attributed to form which is the tendency toward some range of behaviours to the exclusion of others. How a double pendulum is put into motion is trivial, but how it behaves is intuitively inexplicable. The behaviours may still be argued to be merely 'efficient' but it opens the question of why that in nature, from the bottom-up, things are not chaotic but behave in regular ways?

The folding of protein molecules, as a final example, takes to the extreme something having many degrees of freedom yet displaying a unified and regular behaviour. What is it about this chain of amino acids with thousands of degrees of freedom that is the cause of it folding to its lowest energy state non-iteratively? Arguably, it just does, and that is efficient causality. But what is pulling the activity along? The scientific answer may be that it is an energy gradient which needs to be minimised. But it is not obvious as to whether or not gradients are merely explanatory or ontologically real.

Robinson may argue that gradients are merely explanatory, an abstraction that sits on top of whatever is actually there. This may indeed be true, but I argue that if it is, it is not obviously true. Almost all scientific simulation software *predicts* natural phenomena through differential equations (equations that involve, fundamentally, gradients). It is gradients that 'drive' the motions of fluid dynamics and solid mechanics. A gradient at some point is the spatial variation of some property in the vicinity of that point, where 'vicinity' is merely a location distinct from the location at which the gradient is at.

Gradient, it seems, must affirm the principles of identity and relation in order to be real, since it is marking a difference between one location and another (identity of locations) and in some way recognises that that states in these locations are mutually 'visible' (identities in relation). For example, when a metal rod is heated at one end a temperature gradient is introduced along the rod. Given enough time, and the right conditions, the the temperature of the whole rod will be raised to this new temperature, thereby removing

[5] Aristotle appears to characterise randomness as the privation of an expected tendency (Phys II, 8).

any temperature gradient in the rod. If this process was modelled mathematically, the gradient would be said to 'cause' the change of temperature throughout the rod. On the other hand, from Robinson's kind of perspective, no such causal reality of gradient exists, only its explanatory reality. What is not clear about Robinson's position is that, even if gradients are only explanatory, his position still seems to need to invoke some kind of reality which has the features of bearing identity and having some relation among common kinds, at whatever granularity, so as to cause temperature change. To have these characteristics, though, just is to have the characteristics of substantial form (principle of unity), the accidents of quantity and relation, and, of course, to be material existent.

The examples of nuclear decay, double pendulum behaviour and gradient minimisation seem to show that a notion of 'distribution and motion of matter' *first* needs to affirm the reality of hylemorphic composition in order to identify the tendencies of such distributions and motions. To say of some kinds of distribution and motion of matter that they have no substantial forms may in fact be in complete agreement with the hylemorphist, if those kinds were like the example of the *chaotic* behaviour of a double pendulum, *an artefact* of two beams pinned together. But such an example is manifestly different from a decaying nucleus or a folding protein *because* of their regular and stable tendencies, despite them being structurally complex.

It appears that Robinson's view of matter and efficient causation is scientific rather than metaphysical, therefore what has been presented here are arguments of a more scientific bias, though they do attempt to point to metaphysical implications. It would be incumbent on Robinson to account for the metaphysical possibility of change to strengthen his position of rejecting hylemorphism, since he relies on it to frame his minimal problem of the distribution and motion of matter, whereby nothing ontologically irreducible is appealed to beyond matter and efficient activity. No such argument is offered by Robinson, whereas an Aristotelian argument is offered that shows matter and form must be appealed to as irreducible principles of substance.

5 Conclusion

This work has attempted to represent as a starting point of metaphysics, the phenomena of change found in the natural world, in order to argue the position that an irreducible composition of principles is found in everything that undergoes change, and furthermore, this kind of composition is hylemorphic for all material things.

The argument was developed in three stages. The first stage showed that there must be at least a principle of persistence and a principle of change in the human intellect in order to affirm or deny the the thesis of the reality change. The second stage related the principles of persistence and change to at least living organisms through Aristotle's theory of substance and accidents. The final stage expanded the theory of composition to all material things, arguing that in order to have instances of a kind, hylemorphic composition appears to fulfil this requirement.

The core of the hylemorphic position is that everything that changes is a kind (or nature, or essence, or substance). This position at least implies that everything has a corresponding range of potential changes it can undergo, whereby the range is bound by, or coordinated by, the kind of thing that it is. Furthermore, the kind of a thing is distinct from its individuating matter. What undergoes change is the composite, not the kind nor the individuating matter.

The position is not one which lends itself to being readily accepted. A first conclusion of the position, though not emphasised in this work, is that there must be an ultimate bearer of change, pure act, as concluded by Aristotle. This position is affirmed by Aquinas in his Five Ways, where Aquinas concludes that this is what we understand to be God. (ST, I.2.3) Therefore, the position entails a central tenet of classical monotheism. Secondly, the position is, at least in appearance, counter-scientific. If only composites undergo change, rather than kinds, and if speciation just is the differing in kind, the position does not obviously admit mutation of species by efficient causes acting on composites.

On the other hand, one of the persuasive aspects of the hylemophic theory lies in its capacity to ground principles of unity and activity which carry over into human nature. These principles are indispensable for responding to the mind-body problem. Instead of requiring an altogether novel principle in order to account for the unity of personal actions, thereby introducing an additional substance which exactly coincides spatially with the body, as Lowe (2006: 9) does, substantial form, which is pervasive throughout all material things, is capable of fulfilling this role. The hylemorphic theory maintains the human person as a single substance, ruling out the possibility of a 'bionic' body being

bound to a personal substance. (Lowe 2006: 9)

Both substance and individuation are essential aspects of the hylemorphic theory, but both appear to be in need of further clarification. Is substantial form necessarily unchanging or else what kind of causes could bring about change in it? Secondly, how is subsistent form individuated upon corruption of the composite of the human person? Finally, relating substance to individuation, is the notion of energy sufficiently open so as to be a bridge between the informing substantial form and the informed individuated matter? These three questions touch upon some of the difficulties presented in the development of the thesis of hylemorphic composition and would be suitable topics for further investigation.

Abbreviations

DA Aristotle, De Anima. Barnes, J., *Complete Works of Aristotle: The Revised Oxford Translation*, 2 vols (Princeton: Princeton University Press, 2014), I

Cat Aristotle, Categories. Barnes, J., *Complete Works of Aristotle: The Revised Oxford Translation*, 2 vols (Princeton: Princeton University Press, 2014), I

Phys Aristotle, Physics. Barnes, J., *Complete Works of Aristotle: The Revised Oxford Translation*, 2 vols (Princeton: Princeton University Press, 2014), I

Meta Aristotle, Metaphysics. Barnes, J., *Complete Works of Aristotle: The Revised Oxford Translation*, 2 vols (Princeton: Princeton University Press, 2014), II

ST Aquinas, Summa Theologiae. *The Summa Theologica*, Trans. by the Fathers of the English Dominican Province, 5 vols (Notre Dame, IN: Christian Classics, 1981)

DPN Aquinas, De Principiis Naturae. 'The Principles of Nature', in *Selected Writings of St. Thomas Aquinas*, ed. by Robert P. Goodwin, trans. by Robert P. Goodwin (Hoboken NJ: Prentice-Hall, 1965)

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