

HYLOMORPHISM AND DESIGN: A RECONSIDERATION OF AQUINAS'S FIFTH WAY

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Abstract: Aquinas's Fifth Way is usually taken to be an adumbration of Paley-like design arguments. Paley-like design arguments have fallen on hard times over the past few centuries, and most contemporary defenders of design arguments in support of theism favor some version of the fine-tuning argument. But fine-tuning design arguments, like Paley's design argument, are consistent with atomism. And all such arguments are vulnerable to the objection that, given a long enough stretch of time and a sufficient number of universes, there would be no need to posit a designer. In this paper we argue that a deep understanding of Aquinas's Fifth Way depends upon understanding his hylomorphic account of the nature of composite substance, an account that is inconsistent with atomism. We argue that if one grants hylomorphism, Aquinas's Fifth Way is difficult to resist. And we defend Aquinas's hylomorphism against several common objections.

A common story about what is called the "design" (or "teleological") argument for God's existence is that a brief version of it was given by Aquinas in his Fifth Way, that Paley greatly improved on this in his *Natural Theology*, presenting a new version more clearly focused on the internal teleology of living organisms, and that *this* version of the design argument was gravely wounded by Hume and Kant, and killed by Darwin. However (so this story goes), a new version of the argument has arisen in the past 30 years or so that *assumes* Darwinian evolution, but argues that the probability of a universe fine-tuned enough to allow for the evolution of rational animals without supposing it was designed for that purpose is so vanishingly small that denying the existence of God (or of a being possessed of several important "divine making" properties) is similar to believing that an unloaded six-sided die randomly thrown 1,000 times could come up on its sixth side each time.

The fine-tuning design argument (or, rather, family of arguments) is undoubtedly different from Paley's. It shares with Paley's this feature, however: the fine-tuning argument (broadly conceived) is consistent with atomism

(broadly conceived).¹ But Aquinas's Fifth Way can be understood or read in such a way that it does *not* adumbrate Paley or contemporary fine tuning arguments in this regard, but rather points to a distinct sort of design argument. Because the hylomorphic reading of the Fifth Way that we'll propose is inconsistent with atomism, Aquinas's design argument can be seen as precluding a particular objection—one that is both common and troubling—to fine-tuning design arguments.

In this paper we will argue that an adequate appreciation of the Fifth Way requires an understanding of Aquinas's doctrine that composite substances are made of substantial form and prime matter, and that if his hylomorphic doctrine is correct, Aquinas's argument for God in the Fifth Way is difficult to resist. In attempting to achieve what we take to be a correct and deep understanding of the Fifth Way, we will begin by offering in Section I a preliminary statement of its argument (or one important aspect of its argument) and examining two metaphysical principles Aquinas relies on in that argument. In Section II we will discuss an apparent inconsistency between these principles. In Section III we will explicate Aquinas's hylomorphic ontology of material substances, and then in Section IV use that ontology to offer an essentially hylomorphic interpretation of the Fifth Way, showing in the process that the metaphysical principles that initially appeared inconsistent are, in fact, not. In Section V we will consider and respond to several objections to the metaphysics that underlies the Fifth Way. And in Section VI we will offer some concluding remarks.

1 Preliminary Statement of the Argument of the Fifth Way

As is well known, the so-called "Fifth Way" is the last of the brief arguments Aquinas presented in the *Summa Theologiae* for supposing the existence of some being "whom all call God." Any careful student of these proofs knows that Aquinas does not think that any one of these Ways—or indeed the set of them—establishes the existence of a being with a full complement of divine-making properties. What he does think is that each of them makes it reasonable to believe that there is some being (not necessarily the same being) that possesses one or more divine-making properties. It is only later in the *Summa* that, subtly building on these proofs, Aquinas concludes he has established by reason alone that there is one, immaterial, uncreated, omniscient, omnipotent, and perfectly good being who created and sustains the world. Each of the Five Ways concludes only that there is some being who

¹ By "atomism broadly conceived" we mean to refer to any mereology which takes it that macro-objects (e.g. plants, animals, crystals) are made of, or constituted by, smaller (or at least more basic) material substances, whether or not such a mereology supposes that smallest material substances exist or posits the existence of elemental substances which are infinitely divisible but denies there are, or could be, any smallest material substances.

Although fine-tuning design arguments are in broad outline consistent with atomism, it might be possible to develop a detailed version of the fine-tuning argument that incorporates hylomorphism and hence rejects atomism. But if (as we argue) hylomorphism entails an intelligent designer, there might not be much motivation for developing a fine-tuning argument of this sort.

has one or more properties Aquinas held to be divine. The first three Ways focus on metaphysical divine-making properties (being an unmoved mover, a first cause, and a necessary being), while the last two focus on moral and personal properties (being maximally good and intelligent). Of these, the Fifth Way is arguably the most important for piety, since only it explicitly attributes to the cause of the world *action on purpose for the good of the beings it creates*. It goes as follows:

The Fifth Way is taken from the governance of the world. For we see that some things that lack cognition, namely natural bodies, operate for the sake of an end: which is apparent from this, that they always or frequently operate in the same way so that that which is best follows; hence it is clear that it is not by accident, but from some intention, that they arrive at their end. Those things, however, that do not have cognition do not tend towards an end unless directed by something with cognition and intelligence, as the arrow [is shot] by the archer. Therefore, there is some intelligent being by whom all natural things are ordered to their end: and this [intelligent being] we call God. (ST, I, q. 2, a. 3)²

It should be noted that this argument does not explicitly address the difference between intrinsic and extrinsic teleology, where intrinsic teleology has to do with the way things act “always or frequently” in such a way that the best consequence results *for them*, and extrinsic teleology has to do with the way things act as parts of the *cosmos* taken as a quasi-whole, in such a way as to contribute to the good of the cosmos. We agree with the interpretation of several commentators that Aquinas had both sorts of teleology in mind here (in other places he focuses more particularly either on internal or external teleology). But since we think that the argument with respect to *internal* teleology is seriously neglected despite having great power, in this paper we will focus on considerations regarding internal teleology. We will propose what we think is a hitherto unremarked understanding of internal teleology (the picture with regard to teleology is more complicated than might be suggested by the simple distinction typically adverted to between internal and external teleology).

Garrigou-Lagrange, who to the best of our knowledge has discussed and defended the argument of the Fifth Way at greater length than any other commentator, summarizes its main premises as follows: “things which lack intelligence act for an end” and “things which lack intelligence cannot tend towards an end, unless they are directed by an intelligent being which knows this end” (Garrigou-Lagrange 1934, 374). Though we find this helpful, it obviously leaves some important questions open. For one thing the quantification of the premises is not specified. This no doubt reflects Aquinas's text. He begins by

² References to the *Summa Theologiae* are to Aquinas (1888–1906) and are abbreviated as “ST,” followed by the part, question, and article numbers of the relevant passage, and on occasion followed by the number of a reply within the article.

Unless otherwise noted, all translations from Latin are our own.

speaking of “some things” but concludes by asserting that “all natural things” are guided to certain ends by a ruling intelligence. Presumably, though Aquinas did hold that all natural things are directed to certain ends by a ruling intelligence, he began discussing “some things” because he thought that it is more apparent that certain sorts of natural bodies (such as plants and animals) always, or frequently, act in the same way leading to the best possible result. However, we will side-step these matters at present and give a preliminary statement of the argument that rests on premises Aquinas clearly held to be true.

- (1) All material substances lacking cognition of ends (i.e. natural bodies) are substances that act for the sake of certain ends.
- (2) No substance lacking cognition of ends acts for the sake of certain ends unless directed by an intelligence that knows the ends for the sake of which it acts.
- (3) So, all material substances lacking cognition of ends are directed by an intelligence that knows the ends for the sake of which they act.

As we will see later, this is not the deepest statement one can give of the underlying argument of the Fifth Way; but we will begin with it.

2 An Apparent Inconsistency in the Fifth Way

Aquinas, following Aristotle, held that material substances (cats, trees, molecules, etc.) are form/matter composites, “hylomorphic composites,” that have an intrinsic directedness towards certain sorts of activities, towards being in certain states, and towards standing in certain relations. In short, they have a nature that roots in them active and passive powers—for example the power of water to cool, of fire to burn, of cats to see, of stones to be moved, and so forth. No doubt Aquinas’s examples are quaint to contemporary ears, but that does not affect Aquinas’s main point so long as one holds that macro-entities³ such as water molecules do exist and further that, for instance, water has the power to put out fires. Whatever the explanation for this power, it does not seem that the passage of years has shown it to be false that water has it; nor, perhaps more importantly for present purposes, has it been shown to be false that people need water to survive.

We might rephrase Aquinas’s view with reference to natural laws. His understanding of natural laws is that they describe the ways things of a certain sort will act or react in certain situations, and that the basis for these laws (what makes them true, so to speak) is that things possess natures that root in them active and passive powers.⁴ This might be thought to make more sense than supposing that natural laws are ghostly things hovering above material substances, constraining them in some way.

³ We’re using “macro-entity” here to mean an entity in some way divisible into atoms.

⁴ See Aquinas 1884, 56–57 (*In Physicorum*, Liber II, Lect. I).

Garrigou-Lagrange has emphasized that for Aquinas, final causality, every bit as much as efficient causality, is bound up with the principle of sufficient reason. He wrote:

The . . . principle of finality can be defended by showing that it refers back to the principle of sufficient reason, so that to deny the former would lead to a denial of the latter. St. Thomas briefly points this out when he says that "Every agent acts for an end: otherwise one thing rather than another would not follow from the action of the agent." If every agent produces, not any sort of effect indifferently, but a determinate and suitable effect, and this *without tending* towards this effect, without being *ordained* towards this effect rather than towards another; if the acorn produces the oak and not the ash, without its having a definite tendency for the one rather than for the other; if the eye sees instead of hearing, without being meant for seeing rather than hearing—it follows that the non-accidental determination and appropriateness of the effect are without a *raison d'être*, that determination comes from indetermination, that order arises from lack of order, that the perfect originates from the imperfect, the greater from the less—all of which statements are absurd. The determination and the perfection of the effect could not have been realized in it, unless they were in a certain manner contained in the efficient cause. Now, for the effect not to be contained in the cause *actually*, but only *virtually*, could not be unless the efficient cause *tended* towards this effect rather than another, unless it were *directed* towards this effect. (Garrigou-Lagrange 1934, 362–363)

This is a powerful argument. And notice that it is an a priori argument independent of observed regularities in the world. No doubt since we do not know the essences of things from "the inside out" (according to Aquinas), only experience can reveal to us, in a round-about way, something of the nature of a thing and hence of its determination with respect to final causality: but this is consistent with supposing that the principle of final causality, namely that things are determined by their nature to act in specific ways, can be known a priori. And, indeed, Laurence Bonjour has powerfully argued for this position in his book *In Defense of Pure Reason*, showing that without an a priori grasp of something like the principle of finality it is simply impossible to provide a solution to the problem of induction.⁵

There is another important aspect of Aquinas's doctrine of intrinsic teleology we have not yet mentioned: Aquinas's way of opposing hedonism with respect to what is good for things is based on the notion that what is good for a thing is rooted in its nature. Things are not only by nature wound up to act in certain ways; further, their natures ground the fact that being in certain states, performing certain activities, and having certain relations complete or

⁵ Bonjour 1998, 212.

perfect them in various way. Hence, for instance, Aquinas would argue it is good for plants to grow, cats to see, and humans to know because their natures root in them a kind of “directedness towards” these things (ST I, q. 5, a. 1, a. 5; I-II, q. 94, a. 2).

Some contemporary philosophers find this idea of Aquinas’s incoherent. But it is not as far removed from common sense as it might at first seem. We do say such things as “it is good for plants to be watered and to receive sunlight.” And certainly plants cannot experience pleasure or pain, so if we mean what we say here it appears we don’t accept a purely hedonistic doctrine of what is good for things. Furthermore, it seems that we agree, essentially, with Aquinas’s view about the nature of things determining what is good for them, since when we say, for instance, “water is good for plants” that must mean that water is necessary for them to grow, nourish themselves, and in general achieve completion as *being the sorts of things they are*.

Of course one might here object that we also say such things as “it is good for a car to get its oil changed,” even though we know that it is quite silly to suppose that the car benefits from having its oil changed. In fact, we clearly don’t really mean that it is good for the car to have its oil changed—rather what we mean is that it is good for *us* that the car have its oil changed, since the car’s having its oil changed will allow it to perform the function we built it to perform in order to benefit us.

It is interesting to note in this regard that Aquinas would agree that such statements as “it is good for the car to have its oil changed” are *not* literally true, and would also insist that anyone who thinks clearly about the matter wouldn’t think such statements are literally true even when uttering them. But none of this would weaken Aquinas’s conviction that statements like “it is good for plants to be watered” *are* literally true and also that we typically believe them to be so (unless we are misled by bad metaphysics). In the next section we will say more about why Aquinas held that cars cannot be benefited but plants can, and will here note only that, according to Aquinas, cars, unlike plants, do not *rigorously speaking* exist, and since a necessary condition for benefiting something is that it exist, it is impossible that cars could be benefited by having their oil changed.⁶

That there is a tension in the argument of the Fifth Way should now be clear. If unintelligent material substances (plants and brute animals) are by their natures ordered to act in certain definite ways, and if their acting in those ways is intrinsically good for them, not only does there seem to be no reason to suppose that a governing mind is necessary for them to act for the sake of certain ends—it seems that such a mind could no more *make* this be the case than it could make it be the case that modus ponens is valid.

All of this suggests that Aquinas’s Fifth Way, understood in light of his

⁶ Artifacts do not rigorously speaking exist because they are accidental unities produced by human art and no accidental unities, strictly speaking, exist. See Aquinas 1959, 59–60 (*In De Anima*, Liber II, Lect. I, para. 218); see also Aquinas 1961, 466–467 (*Commentary on the Metaphysics of Aristotle*, Vol. II, Book VI, L. II).

teleological doctrine, embodies a conceptual mistake of mind-numbing grossness. But, as William Rowe noted when discussing a common objection to the Third Way (namely that it commits the fallacy of composition), one should be leery of accusing a philosopher of Aquinas's stature of errors of mind-numbing grossness. In the next section we will lay the groundwork for an essentially hylomorphic interpretation of the Fifth Way, an interpretation that we will set out in Section IV. And in the course of this we will answer the inconsistency objection.

3 Aquinas's Ontology of Material Substances

Aquinas's hylomorphic account of material substances is brilliant and complex, and was peculiar even in its medieval period. In particular, the majority of great medieval scholastics did not agree with his view of the purely potential nature of prime matter. But there can be little doubt that whatever problems beset Aquinas's doctrine, it is one of the great attempts to account for the substantial unity of material substances in a way that also respects their composite nature.

Following Aristotle, Aquinas analyzed what philosophers now typically call "natural objects," but which he called material substances, into two ultimate principles: prime matter and substantial form.⁷ For Aquinas, substance is the fundamental category of being and it transcends the physical realm.⁸ According to Aquinas a substance is an essence to which it is due not to exist in a subject—that is, if it exists, it doesn't exist as a state or feature of something else.⁹ This description of the nature of substance involves the prior, and strictly speaking indefinable, concept "essence." According to Aquinas the essence of a thing is what-it-is, or, alternately, that which corresponds to correct conceptions and definitions of it.¹⁰ One is perhaps helped to grasp Aquinas's notion of essence by observing that he insists that there is no such thing as "being as such." Every being has an essence, which means every being is an individual being of a certain sort.¹¹ *To be is to be an x that is an F* (an individual cat, horse, color, thought, shape, and so on). Some essences,

⁷ Aquinas argues for this in many places, most tersely in 1965, 7–14 (*The Principles of Nature*, Chapters I–II).

⁸ See Aquinas 1965, 36 (*On Being and Essence*, Chapter I).

⁹ See Aquinas 1934, 27 (*Summa Contra Gentiles*, Liber I, Caput XXV).

¹⁰ See Aquinas 1965, 34–36 (*On Being and Essence*).

¹¹ It might be objected to this that Aquinas often calls God "subsistent being itself" and also that he holds that designated matter is the principle of individuation. But Aquinas is quite clear that when he says God is subsistent being itself he does *not* mean that God is the universal "existence"—rather he means God is pure act, possessing every absolute perfection of being to an infinite degree. See 1965, 58–59 (*On Being and Essence*, Chapter V) and ST I, q. 4, a. 2. And Aquinas is also clear that universals exist only "in the mind" (i.e. as objects of thought), not in reality. See 1965, 48–49 (*On Being and Essence*, Chapter III). Hence, his holding that designated matter is the principle of individuation should not be taken to imply he thought that the angels or God are not particulars—all it should be taken to imply is that he thought there cannot be many angels that are the same in species (i.e. each angel is the sole possible member of its angelic species), nor many divine beings. See 1965, 54 (*On Being and Essence*, Chapter IV).

if they exist, cannot exist as states or features of other essences. These essences are *substantial* essences. Non-substantial essences, that is, essences such that if they exist they *do* exist as states or features of something else, were called by Aquinas “accidents.”

Substantial essences, according to Aquinas, are per se unities, not accidental unities. For Aquinas an accidental unity consists either of a number of substances related to each other in a certain way, such as a number of pearls on a string (ST III, q. 2, a. 1), or of a substance with one or more of its accidents (e.g. a pale man).¹² An interesting aspect of this doctrine is that it entails that no artifact is a per se unity, and hence that no artifact is a substance. An artifact is either a number of substances put together according to a certain relational structure (e.g. a watch) or a substance with a certain accidental form (usually a shape) imposed on it (e.g. a marble statue).¹³ Another interesting aspect of this doctrine is that artifacts have only extrinsic final causes. And this is another way of saying something we noted in the preceding section, namely, that we cannot sensibly say that it is literally true that it is good for a car to have its oil changed. But, or so Aquinas thought, true material substances do have intrinsic final causes. So we can sensibly say that it is literally true, for instance, that sunlight is good for plants. And Aquinas’s way of affirming this was to say that plants, and other material substances, have intrinsic final causes. This, of course, requires that plants are per se unities, and so possess a greater unity than that of any artifact; indeed it requires that plants possess the sort of unity characteristic of single substances.

One way to support Aquinas’s idea that plants have a per se unity is by looking to their activities, and above all to growth. Growth is what Aquinas called an immanent act, that is, an act that in part involves a substance producing some new accident in itself, as occurs with sensation and homeostasis. Aquinas denied that growth is mere accretion.¹⁴ When a plant (or an animal) grows it transforms the matter of something else into itself, thereby augmenting its own quantity. The plant, in Aquinas’s eyes, in growing is *biggified*—it, the plant itself, becomes larger than it was before. This is an extremely odd notion from a modern point of view, but then, again, it is scarcely noticed that the modern view, resting as it does on a doctrine of the nature of material substances that is, with respect to the most essential philosophical points, the same as that of the ancient Greek atomists, doesn’t really allow for *anything* to grow. Atoms certainly don’t and can’t grow, nor can the aggregates they make up do so—all that can happen to *them* is that more atoms, or aggregates of atoms, become conjoined with them (like snow flakes attaching to a snow ball) or that the atoms “constituting” them move away from each other (as occurs when steam is produced). But neither of these processes can in any way be thought to be instances of growth.

Let us suppose that Aquinas is right about growth and other immanent

¹² Aquinas 1965, 8–9 (*The Principles of Nature*, Chapter I).

¹³ Aquinas 1884, 59–60 (*In Physicorum*, Liber II, Lect. II).

¹⁴ Aquinas 1959, 89 (*In De Anima*, Liber II, Lect. IX, paras. 341–342).

actions. If he is right, then living beings, at any rate, do exhibit a unity missing from a piece of cloth or even a watch. But there is this problem: living beings, even if they are *per se* unities, have what the Schoolmen called integral parts, such as the leaves, branches, trunk, and roots of a tree. These are not only locally distinct from each other; they differ structurally and functionally and at least in some sense can be separated from the whole they are parts of (though Aquinas would say that a leaf severed from a tree is a leaf only metaphorically). Put another way, living beings do not have the unity of Leibniz's monads or even of Newtonian space, the "parts" of which are not qualitatively different from each other and which cannot be separated from each other (in the sense of being divided by cutting). This presents a deep metaphysical problem according to Aquinas, one he thought that the hylomorphic theory alone could solve. Using this problem as a springboard, we can reconstruct one of Aquinas's arguments for hylomorphism¹⁵ (call it AFM, the "argument for form and matter"):

- (1) There are substances characterized by integral parts.
- (2) All substances characterized by integral parts are composite substances (i.e. substances in some way made out of, or constituted by, more than one distinct entity).
- (3) Either (A) all composite substances have another substance as a proper part, or (B) all composite substances are made exclusively out of accidents, or (C) all composite substances are made exclusively out of substantial principles.
- (4) \sim A
- (5) \sim B
- (6) If all composite substances are made exclusively out of substantial principles, then they are made of substantial form and prime matter.
- (7) So, if there are substances characterized by integral parts, then they are made of substantial form and prime matter.
- (8) So, there are substances made of substantial form and prime matter.

Taking (1) and (2) to be fairly obvious from what we have said, we wish to say something about how the remaining premises follow from the tenets of Aquinas's system.

Premise (3) exhausts the possibilities within Aquinas's system.

In support of (4), Aquinas would insist that a number of substances, no matter how intimately related, are just that, a number of substances intimately related (ST I, q. 76, a. 4, ad. 4). And, if one supposes this isn't the case, and yet believes that composite substances exist, it seems one must

¹⁵ Aquinas's main argument for hylomorphism was an argument from substantial change, but the argument we give here is certainly in accord with his fundamental principles and implicit in many passages in his work (see, e.g., ST I, q. 72, a. 4).

suppose that a true composite substance is an emergent entity that depends on the smaller substances it inheres in. But this would make a composite substance a state or feature of a number of other substances, something that is a flat contradiction if we accept Aquinas's definition of substance as that to which it is due not to exist in a subject (or subjects).

Premise (5) of AFM should, we think, be fairly evident—given Aquinas's overall system. Accidents are parasitic on substances—they are, as the Schoolmen said, “beings of beings,” and so they could not possibly constitute a substance. To suppose that material objects are made up of accidents (or things in some way analogous to them) would, in fact, be to abandon substantialism for the view that material objects are bundles of property tropes.

But even if one grants all this, one could take it to entail there can be no composite substances. In fact, many great metaphysicians have held exactly this, whether they endorsed some form of spiritualistic monadism, or physicalistic monadism, or a mixture, or monism. But Aquinas was convinced, above all by the activities of living beings, that there are true composite substances and that they are made out of two substantial principles, prime matter and substantial form.

Before turning to premise (6) we need to explain why Aquinas had this conviction.

For Aquinas a principle is “that from which something, in some way, proceeds” (ST I, q. 33, a. 1). This of course is not very precise, but even the greatest metaphysicians must stammer when it comes to explicating the primitive concepts of their systems. At any rate, we can say that, for Aquinas, a principle of a thing is essential to the thing's origin, whether extrinsically (as the sun is the principle of its rays), or intrinsically (as form and matter are with respect to material substances).

Both form and matter, for Aquinas, are analogous notions: they don't apply to the things they do apply to either univocally or equivocally, but in partially the same, partially a different way. Matter, in general, is any determinable insofar as it is determinable, that is, capable of further determination, while form is any intrinsic determination of a determinable. In this broad sense, every finite substance is matter (or, the material cause) of its accidents. Baby Sue, being human, is a determinable entity, capable, for instance, of acquiring the ability to speak. Once she does she will be determined by that ability, and the ability will be a determination of her, hence a form, more specifically an accidental form (all accidents are forms for Aquinas, though some of them are also, relatively, matter, if they are capable of further determination).

Prime matter and substantial form are radically material and formal—they are, as it were, the ultimate instances of the analogous concepts *form* and *matter*. We can give the following necessary and sufficient conditions for them:

Something is *prime matter* if and only if it is a pure determinable lacking in quality, quantity, and active power, such that, if informed by any one of a range of substantial forms, it will be one of the two essential constituents of a complete substance.

Something is a *substantial form* if and only if it is a determination of prime matter, which with it constitutes a composite substance with certain sorts of active and passive powers, capable of further accidental determinations with respect to those powers.

We can say a little more to shed light on the notions of form and matter by noting that though neither the matter nor the form alone is wholly responsible for any feature of a composite substance (since if one of them were, it would itself be a complete substance, not a substantial principle¹⁶), matter is more responsible for those features of composite substances that (1) are common to all of them (we might speak of these as features that physics studies) and (2) are more passive (quantity, inertia, divisibility). Form is more responsible for those features of composite substances that (1) distinguish them from each other (thus it is the form of a lion that distinguishes it from a man) and (2) are more active (the power of a plant to grow or a man to see). Finally, matter is the principle of distinction within a species. Two lions are fundamentally distinguished from each other by the different bits of matter that their forms inform.¹⁷

Having explicated the notions of form and matter, we can now turn to premise (6) of AFM, the claim that if composite substances are made of substantial principles, then they are made of substantial form and prime matter.

Why think premise (6) is true? To begin with, the only philosophical tradition that has worked out any intelligible account of substantial principles is the hylomorphic one. And besides, it seems the principles need to be interpreted relationally, so, assuming there are two, one unifies and determines, and the other is unified and determined. In other words, unless (6) is true it is impossible for there to be a composite, whether substantial or accidental. Without a formal principle the composite will lack determination, actuality, and unity. A number of boards (the material principle of a wooden house), for example, existing without the proper relational structure (the formal principle of a house) will not constitute a wooden *house* (an accidental composite). Without a material principle, one will have only a pure or separated form—such a form will be intrinsically determinate, actual and one, but, since it will not inform anything, it will “constitute” a simple being (e.g. an angel), not a composite one. One can put the point tersely this way: without

¹⁶ Besides that, even if we suppose, contra Aquinas, that natural substances, like artifacts, are made up of other substances, it seems clear that very few, if any, of their attributes could be explained by reference to the attributes of just one of the substances constituting them. The attributes would instead be explained by a kind of relational blending of all, or of several, of those substances' attributes.

¹⁷ See Aquinas 1965, 64–65 (*On Being and Essence*, Chapter VI).

form *a* composite won't exist, and without matter, a *composite* won't.

4 A Revised Statement of the Intrinsic Teleological Argument of the Fifth Way

Bearing in mind all we have said in the last section about the hylomorphic constitution of material substances and about the natures of form and matter, we can now return to the Fifth Way informed by aspects of Aquinas's metaphysics that are necessary both to answer the inconsistency objection to his teleological argument, the objection we described in Section II, and to grasp the bearing of that argument on the intrinsic teleology of material substances.

In the Treatise on Divine Government in the *Summa*, Aquinas himself raises the inconsistency objection. His response to it is as follows:

. . . the natural necessity inhering in things that are, without exception, determined in the way they act is a certain impression from God directing them to their end, just as the necessity by which the arrow is driven so that it tends to a certain mark is an impression from the archer and is not of the arrow. But in this they differ, because that which creatures receive from God is their nature, but that which is imprinted on natural things by humans is outside of their nature and extends even to violent motion. Hence, just as the necessity of the impetus in the motion of the arrow demonstrates the direction of the archer, so the natural necessity of the creature demonstrates the government of divine providence. (ST I, q. 103, a. 1, ad. 3. We should note that we take "impression" here most especially to refer to the substantial form of material substances.)

In this passage Aquinas responds to the inconsistency objection by insisting that the natures of all things other than God were impressed upon them by God.¹⁸ One might wonder what non-question-begging reason Aquinas had for thinking this is so. In fact he had several. But here we want to focus on a line of reasoning grounded in his hylomorphic doctrine, since the Fifth Way clearly focuses on material substances that lack intelligence—"natural bodies," as Aquinas calls them.

Here, then, is the revised version of the argument in the Fifth Way (construed as focusing on a special sort of intrinsic teleology):

- (1) There are material substances.
- (2) Every material substance depends for its existence on unification of the principles of form and matter.

¹⁸ One can say that for Aquinas God creates the natures of finite substances but does not create their intrinsic possibility—that is rooted in God's essence. That is, God's essence is imitable in an infinity of ways, and the ultimate ground of the intrinsic possibility of created natures is in this infinite imitability of God (ST I, q. 44, a. 3).

¹⁹ Speaking more precisely, it should be said that God creates composite substances and in so doing co-creates matter and form, since matter and form don't so much exist as they are intrinsic principles *by which* material substances exist (ST I, q. 45, a. 4).

- (3) If 1) and 2), then there is some intelligent substance that creates the matter and form of every material substance.¹⁹
- (4) So, there is some intelligent substance that creates the matter and form of every material substance.

Let us call this argument AHD (for the “argument from hylomorphic design”).

Aquinas would say that premise (1) is in some way evident to the senses, and would also argue that the integral parts of living beings evince their being material—no immaterial substance has integral parts.

Premise (2) is supported by AFM and also by arguments Aquinas gave based on substantial change.

This leaves premise (3).

Let us begin here by returning to Aquinas's distinction between form and matter, and making a point about that distinction that is surely implicit in Aquinas²⁰—but made explicit by Suarez. It is that form and matter are *intrinsically partial entities*. This does not mean that they are, so to speak, half-way between existence and non-existence; it means that they are, by their nature, directed towards constituting a composite substance, and could not naturally exist separately from each other.²¹ Suarez puts the point this way:

... there are certain things that are wholly absolute [i.e. are not relations] which are said to take their species through an aptitude to something to which they are ordained, not as to a terminus, but as to an intrinsic end on account of which they were made. This order is not a relation because it does not posit in such a thing formal dependence on that to which it is ordained, as is obvious, since the [rational] soul is able to endure although the body has been corrupted. [The same occurs with] a power although its object has been destroyed, and with knowledge although nothing knowable exists. Such an ordination pertains to the essence of a thing because by its nature this thing receives a determinate essence, so that, through it, it is apt towards some end. This aptitude is absolute and intrinsic to the thing itself.²²

Suarez goes on to use artifacts to give some explanation for this. A drinking glass, if we consider it (wrongly, according to Suarez) to be *a* substance, is such that by its very nature it can hold water, even if it is currently not doing so. Thus, in virtue of certain non-relational properties it has, a glass is capable of having a “holding relation” to water. But, Suarez insists, the capacity of the glass to have such a relation, is, as it were, accidental to it—in fact, for Suarez, *being-a-drinking-glass* is what we might call an imposed property, a way in which we think about it. So too, stones that might be used to build a house,

²⁰ See ST I, q. 76, a. 1, ad. 6.

²¹ The sole exception to this rule is the human soul, which according to Aquinas is subsistent and so able to exist in separation from matter.

²² Suarez 1978, 104 (*In De Anima*, Disputation I, q. 3, sec. 12).

though their intrinsic nature makes them suitable for such a use, are not by nature ordered to constituting a house—it is accidental to them, in other words, that they can be used this way.²³ In contrast, it is not accidental to the natures of form and matter that they can constitute a composite substance—it is a deep aspect of what they are. Thus Suarez can say the following about form and matter:

... just as matter is not something other in its essence than an entity apt to receive a form, and thus potency for receiving form is the very being of matter, so form in its essence is not anything other than an entity apt for informing matter, and that aptitude is not something accidental to the form, but is itself the essential difference of the form.²⁴

This point about form and matter, namely that they are by their natures ordered to constitute a composite substance, rather than being, by their natures, suited to form some sort of aggregate that might be useful for human purposes, provides the key for understanding premise (3) of AHD. Matter and form are not the sorts of things that can bump into each other, the way atoms careening around space can. They aren't available to be randomized,²⁵ because they are intrinsically partial: they are at the very roots of their being ordered to constituting a composite substance rather than being already existing substances extrinsically formed or shaped (in the way one might sharpen a stone and attach it to a shaved stick to form a spear) so as to be able to be joined with other extrinsically formed substances in order that all these substances could act in concert to produce certain desired effects. How do these intrinsically partial principles of form and matter come into proximity with one another? For form and matter to be instantiated in a particular material substance they must have an *intended proximity*. And that can occur only in a designing mind.

It might be thought that the principles of form and matter could simply be *abstracted* from material substances once they are in existence, so there need be no question about how they came together to form a substance. But while there is a sense in which we infer the principles from material substances that already exist (namely, we observe the substances and argue to the existence of the principles), for the principles to have the explanatory force that hylomorphism assigns them they must be ontologically prior to the material substance and *generative*. And that means the principles must have an intended proximity from a designing mind.

To appreciate the point that form and matter are by their natures ordered to constitute a composite substance, it is important to distinguish between (1) its being the case that “formness” and “matterness” (so to speak) are by nature ordered to each other to constitute a substance, and (2) its being the case that form, matter, and composites made of them exist. No intelligent being

²³ Cf. ST III, q. 2, a. 1.

²⁴ Suarez 1978, 92 (*In De Anima*, Disputation 1, q. 3, sec. 4).

²⁵ We thank James Madden for this felicitous turn of phrase.

is necessary for (1), just as no intelligent being is necessary to make it be the case that roses are flowers. Indeed it seems incoherent to suppose that an intelligent being could, by any purposeful action, causally contribute to the state of affairs (1) describes. But this doesn't make it unreasonable to think that an intelligent being is necessary to bring about the state of affairs (2) describes.

The fact that complete substances are not by their nature ordered to composing artifacts, but merely have such accidental properties as to make them *suitable* to uniting with other substances to form a relatively stable aggregate that may be of use to humans or other animals, is at the very root of the most powerful sort of objection to a Paley-like design argument. The great 19th-century philosopher Hermann Lotze's objection to any design argument clearly assumes what we have called atomism in the broad sense:

If we take for granted that an indefinite multitude of different elements act upon one another entirely in accordance with mechanical laws, and that they were aboriginally in reciprocal motions which were not regulated by any design, then there might issue from such conditions innumerable possible consequences. The forms possessed of an immanent conformity to an end would represent only a very insignificant number among these possible consequences; and therefore they would have very little probability of coming into existence . . . But with reference to the past we are at liberty to assume, that at the first an innumerable multitude of inharmonious forms, intrinsically hostile to any end, actually emerged from the reciprocal impact of blind elements; that these forms, however, were not able to maintain themselves in the course of nature, as against the constant assaults from without; that, on the contrary, only those few forms held out which had chanced to be the more fortunate; that then these fortunate ones exerted more and more a determining influence upon the rest; and thus that gradually it has come to pass, that nature runs its course, not indeed in complete perfection and conformity to an end, but after all to such an extent that there still remain but few disturbances or interferences by which the development and perpetuation of the structures that are conformable to an end, is endangered. In this way, therefore, it would not be unthinkable that an original chaos gradually shaped itself into a nature that is arranged in conformity to ends.²⁶

In essence the atomists' objection to the need for a governing intelligence in order to explain the coming to be of stable aggregates of micro-entities (which aggregates we call "natural bodies" or "macro-entities" or even "material substances") always boils down to the line of reasoning Lotze here sets forth.

But if one focuses on a design argument emphasizing the special sort of intrinsic teleology we've here called attention to, then the objection Lotze artic-

²⁶Lotze 1886, 19–20.

ulates cannot get off the ground.

We can flesh this point out a little by returning to a comment we made at the beginning of this paper, when we suggested that the picture with regard to internal and external teleology is more complicated than might be suggested by the simple distinction standardly drawn between internal and external teleology. There are at least two sorts of internal teleology: (1) matter and form are joined to constitute a substance, and thereby act for the good of that substance since it's good for it to exist and have a nature; (2) the substance acts for its own good, and is able to do so because it has a particular nature—for example, the cat drinks water, extending its life. *Our focus here is on the first of these sorts of internal teleology.* (We might add that the picture is further complicated by the fact that internal and external teleologies are interrelated: when a substance acts for its own good it is also acting for the good of the whole—for example, the cat uses oxygen by breathing and gives off carbon dioxide, and the tree uses carbon dioxide and gives off oxygen. And there are structural parallels among the sorts of teleologies: matter and form fit or complement each other; similarly, plants and animals fit or complement each other.)

The first sort of internal teleology might be called *constitutive intrinsic teleology*. The intrinsic teleology of the essential parts of a hylomorphic composite, namely form and matter, is to constitute a composite that is per se one in the substantial order. We might then speak of *non-constitutive intrinsic teleology* to refer to the teleology of the composite substance itself (i.e. its being by nature ordered to being in certain states, having certain relations, and performing certain activities). Most contemporary discussions of Aquinas's teleological doctrine focus either on his view of extrinsic teleology or—more often—on his view of what we have called non-constitutive intrinsic teleology. But Aquinas himself frequently discusses constitutive intrinsic teleology and when he does so at any length he links it to non-constitutive intrinsic teleology.²⁷ This makes sense since the constitutive parts of a hylomorphic composite, by fulfilling their intrinsic teleology, complete an essence that roots in the substance whose essence it is a directedness towards being in certain states, having certain relations, and performing certain activities. But though constitutive and non-constitutive intrinsic teleology are intrinsically linked, it is a mistake, we think, to fail to distinguish them. The failure to distinguish them obscures the true force of the Fifth Way.²⁸

Contemporary fine-tuning design arguments, which focus either exclusively on external teleology or on external teleology together with internal teleology of the second sort, are vulnerable to the type of objection Lotze articulates. But AHD, which focuses on the first sort of internal teleology, is not vulnerable to Lotze's sort of objection.

Before we move on to the next section of this paper we want briefly to

²⁷ See, for example, ST I, q. 65, a. 2.

²⁸ For an extremely careful discussion of the difference between constitutive and non-constitutive intrinsic teleology as well as their essential relation to each other, see Suarez 1978, 106–132 (*In De Anima*, Disputation I, q. 4).

address two objections to AHD that grant the truth of hylomorphism. (In the next section we will take up objections to hylomorphism itself.)

The first objection is that even if we are right that it is impossible to create hylomorphic substances without purposely creating their matter and form, it does not follow that the hylomorphic substance is purposely created. The most important thing to say here is that getting the conclusion that matter and form were purposely created is good enough if one's interested in arguing for purposeful creation—for a designing mind. But another point may be added. If one is justified in thinking that a watch on a heath was made on purpose for a reason by some rational substance (something not even Hume called into question), then surely one is also justified in supposing that any substance responsible for the existence of hylomorphic composites acted on purpose, for a reason, in producing such substances. It seems virtually impossible to doubt that any substance that is responsible for there being hylomorphic substances *created* (or *concreated*) the partial substances (form and matter) in order that they constitute some composite substances. Presumably this could not be the end of the matter (further purposes, it seems, must be involved in the creating of composite substances via the creating of partial substances), but we need not have a clear grasp of these further purposes,²⁹ nor need we even speculate about them, in order to have good reason to think that premise (3) of AHD is true.

The second objection runs as follows: even granted that hylomorphism is true, it seems possible that the world has always existed with hylomorphic composites in place, and hence possible that in order to understand the coming to be of any one of them it would be sufficient to appeal to the action of earlier hylomorphic composites that, in virtue of their forms, are capable of educating new substantial forms in matter. This objection is similar, of course, to a standard objection to Aquinas's Second and Third Ways.

Here we can only gesture towards what Aquinas's deepest answer to this objection would be: contingent beings need to be sustained in being here and now by a non-contingent being, that is by a being that is pure act, existing in virtue of its unlimited essence. For Aquinas, *contingent* being *participates in being* in something like the way that Platonic particulars participate in their forms; and just as for Plato it is impossible that a particular continue to exist without participating in its form (ST I, q. 44, a. 1), so for Aquinas it is impossible for a contingent being to exist or continue to exist without being sustained in being by a being that has its being from itself (ST I, q. 104, a. 1). Contingent beings don't cause the very *being* of anything; else they could ground their own being (ST I, q. 45, a. 5, ad 1). They either cause the *becoming* of something by introducing a new accidental or substantial form into a subject, or they complete an essence (as form completes the essence of matter) that is intrinsically able to exist (in the way form and matter alone aren't) but needs to acquire the act of existing from the being that, as subsistent being, is

²⁹ For a concise account of Aquinas's teleological doctrine with respect to both intrinsic and extrinsic teleology see ST I, q. 65, a. 2.

its own existence (ST I, q. 44, a. 2). Aquinas points to many aspects of things in the world that he thinks show they are contingent and hence participate in being—they change, they are generable and corruptible, they are able not to be, they are imperfect, and, finally, they are made of form and matter. Their being made of form and matter indicates first, that they are contingent and hence participate in being, and second that the being upon which they depend for their existence is intelligent, since contingent entities such as form and matter, which have an intrinsic directedness towards each other and the composite they together constitute, could not have been created by a being that did not act on purpose and for a reason (i.e., that did not have the intrinsic teleology of their natures in mind when it created them). This understanding of contingent being is, no doubt, far from evident to most contemporaries and a defense of it would involve a defense of Aquinas's difficult doctrine of the real distinction between essence and existence in contingent beings.

But there is another way to defend Aquinas against the objection at issue. We may simply point out that, according to the most generally accepted current cosmology, the material world didn't always exist. Assuming then that hylomorphism is true, the simplest of material substances (whatever they turn out to be) are themselves hylomorphic composites. And they could not have come to be by generation (i.e. by the eduction of a new form in some matter previously existing under another form); they could only have come to be by creation (i.e. from nothing as from a terminus *a quo*), their form and matter being concreated with them, since matter, being pure potency, cannot exist without form, and since form is not itself a being but a being by which something else has being (ST I, q. 45, a. 4).

5 Hylomorphism in Question

It should be clear by now why we said in the introduction that Aquinas's Fifth Way is hard to reject if one grants his hylomorphism. We realize most today will not only not grant it, but think it about as worthy of consideration as geocentrism or the doctrine of the four elements. Hence they will think that however powerful the intrinsic teleological argument of the Fifth Way might be if taken on its own terms, it is actually less powerful even than Paley's argument since Paley, at least, shared the atomistic assumptions of modernity.

A critic would do well, however, to pause before so summarily rejecting Aquinas's hylomorphism. The existence of a Thomistic school stretching back from Hervaeus Natalis (1250–1323) and John Capreoulus (1380–1444), through Cajetan (1468–1534), John of Saint Thomas (1589–1644), Jean Gonet (1616–1681), Tommaso Zigliara (1835–1893), and Jacques Maritain (1882–1973) up to John Wild, Elizabeth Anscombe, Peter Geach, Eleonore Stump, and other 20th and 21st-century thinkers not steeped in scholasticism is a witness to the power of Aquinas's system. Nor ought it be thought that Aquinas's endurance should be credited to the universal acclamation of Roman Catholic authorities, because the acclamation hasn't been universal. Indeed, the condemnations of the archbishop of Paris in 1277 reportedly took place

at the behest of Pope John XXI. But Thomism's intrinsic strength was such that it survived these condemnations. And it did not wither under the powerful philosophical arguments of the medieval followers of Scotus and Occam, or the mighty theological attacks of Martin Luther. Indeed the integrity of Aquinas's system endeared it to Phillip Melanchthon, Luther's co-reformer, and the final version of his celebrated *Loci Communes*, the first Protestant systematic theology, shows a marked Thomistic influence. And after John Gerhard, the greatest Lutheran theologian of the 17th century, wrote his magisterial *Loci Theologici* (a work that refers often and usually with approval to Aquinas), Aquinas attained a virtually unassailable stature as a Church teacher for Protestant theologians. Nor has Aquinas's thought exercised an influence only on Christians. Mortimer Adler, a man raised by secular Jews, became an admirer and defender of Aquinas's thought in the 1920s, even while remaining for decades an agnostic (with theistic leanings). Truly, in the entire history of Western thought, Aquinas must rank behind only Plato, Aristotle, and Augustine for his influence through the centuries, with Descartes, Locke, and Kant a considerable distance further back.

We cannot here give a complete defense of Aquinas's hylomorphism, but we do wish to answer several of the most powerful objections to it. Our hope is that by doing so we will pave the way for more serious consideration of Aquinas's peculiar kind of design argument in future discussions.

Objection 1: Aquinas's view that an organism is not made of other substances is false, because: (a) we can actually perceive these other substances in organisms, and (b) structural explanations of what organisms can do imply that they are made of other substances.

According to Aquinas's hylomorphism, no substance is made of other substances. As we have seen, this principle of the hylomorphic doctrine is a corollary of Aquinas's definition of substance.

It might be objected (in the first instance) that hylomorphism must be false, because we can actually perceive other substances in organisms. On this line of thinking, perception, the naked eye augmented by microscopes, shows that objects Aquinas held to be composite substances, such as plants, are made up of other substances, such as water molecules. Though one might respond to this by denying that water molecules are substances, it seems one could simply modify the objection by insisting that even if water molecules are not substances, they are surely not, on Aquinas's theory, bundles of property tropes (what he called "accidents"), and hence are aggregates of smaller substances.

Assume, for the sake of simplicity, that water molecules are substances. Supposing that they are, we can immediately detect the weakness of the objection. One cannot perceive substances directly; one can only perceive what the Schoolmen called their accidents. This is in line with Hume's philosophy, for if one can perceive substances then Hume's phenomenalism is refuted by perception. But surely, whatever the weaknesses of Hume's thought (and there are many, in our opinion), he was correct to suppose that neither substances

nor causal powers are able to be directly perceived by the senses. Thus, if we only sense accidents and not substances, Aquinas can argue (e.g.) that living beings have water-like accidents in certain parts of their extension, but that this fact does not by itself show that any living substance is literally composed of water molecules.

The objector might respond—this is part (b) of the objection—that structural explanations of what organisms can do imply that they are made of other substances.

The great modern philosophers are thought to have paved the way for many of the most powerful explanations of the powers and properties of macro-entities by abandoning the hylomorphism of the medievals and adopting what they called a “mechanical” view of nature that saw even living bodies as natural machines, the properties of which can be explained by an account of the properties of the smaller substances making them up and the way those smaller substances are related.

Of course, as we have seen, Aquinas insists that no machine is, in fact, one thing—it is a number of things related in certain ways such that they may, by their joint action, produce certain effects (like a number of persons rowing a boat). But even if Aquinas was correct on that point (and it is a point that Leibniz agreed with), it is not enough to dispatch with the mechanistic case against hylomorphism since it does certainly seem that, for instance, William’s health depends on his liver functioning properly and that that depends on the parts his liver is made of (molecules, atoms, etc.), their properties, and the way they are related. In short the atomist might agree that Aquinas is correct in thinking that a number of substances, no matter how closely they are related, do not a substance make, but deny that living beings are single substances.

In order to answer this objection to hylomorphism, it is important to note that Aquinas never denied that certain accidents in the matter of a substance are required for a certain form’s informing (or more perfectly informing) that matter. Thus a human body—abstracting from its form, the soul—can be considered to be a certain matter informed by a host of accidental qualities that make it the fit receptacle for the human soul. The human soul has need of a brain in order to inform a body, and the brain, for Aquinas, being an integral part of one substance, cannot be a number of distinct substances related in various ways—rather, it must be matter, with a range of exquisite accidental dispositions necessary for the information, in it, of a rational soul.

Summarizing all this, we can see there is a similarity to the Thomistic replies to parts (a) and (b) of this objection in that both stress the reality of accidents and their ontological importance as being bound up with the very nature of various substances. The first response stresses that true chemical compounds have present in them accidental qualities like the qualities of the elements from which the compound was formed, while the second stresses that certain accidents are necessary in the matter in order for particular forms to inform the matter at all, as well as to most perfectly inform it. Thus certain dispositions are necessary in the matter of a substance for a sensitive soul to emanate in it

the power of vision, and if these accidents are diminished the composite made up of the appropriately disposed matter and the sensitive soul will either be unable to see as well as it otherwise would have been able to, or will not be able to see at all. Finally, some dispositions in matter are necessary for the soul to inform the matter, *period*. In a human and an animal these are particularly clear with respect to those accidents that “constitute” the brain.³⁰ All this shows that a hylomorphist can accept the existence and importance of structural explanations, but will see these *not* as implying that a composite is made up of a number of substances related in certain ways (since such an explanation will make the existence of the composite impossible) but rather as implying that the matter of a body has resident in it certain kinds of accidents in certain of its integral parts, accidents that dispose the matter for the information of a certain sort of substantial form or for the information, in certain of the integral parts of a composite substance, of powers that have their root in that substance's substantial form.

Objection 2: Aquinas's hylomorphism makes substantial change impossible.

According to Aquinas prime matter is unable to exist without being informed by some substantial form, and not even God, who is capable of actualizing every absolutely possible state of affairs, could conserve prime matter stripped of all form (ST I, q. 66, a. 1). Thus for Aquinas the scholastic axiom *forma dat esse* (form gives being) should be taken in the most radical sense—not that form gives proximate being to the composite taken as the sort of composite it is (e.g. human) but that it gives being *simpliciter* (simply, or without qualification) in the order of formal causality such that without it matter would of necessity lapse into non-being. But if substantial form gives being so radically to matter that matter cannot exist without form, then it seems that substantial change is impossible: it is impossible that the matter that was actualized by the form of an acorn come to be actualized by the form of an oak, since with the loss of its acorn-form the matter in the acorn would cease to exist and so could not be transformed into the body of an oak.

This entailment of Aquinas's theory (if it is an entailment) not only seems to go against science but to flout common sense. For surely common sense does hold that all oak trees come from acorns precisely in this sense, that acorns are changed into oaks (or, to be more precise, that some thing or things constituting acorns come to constitute oaks). Furthermore, that substantial changes occur is an integral part of Aquinas's own ontology—indeed his most prominent argument for hylomorphism presupposes that they occur.

We think, however, that Aquinas's theory does not entail there are no substantial changes. This is because it does not follow from its being a necessary condition of matter's existence that it be actualized by some substantial form, that it cannot change substantial forms, so long at least as the change is instantaneous. Consider this analogy: a lump of clay, it seems, cannot exist unless it

³⁰ See Aquinas 1961, 562–563 (*Commentary on the Metaphysics of Aristotle*, Vol. II, Book VII).

is characterized by some shape (though that shape need not be a regular or recognizable one for which we have a name), but it doesn't follow from that that the clay cannot change shape, so long as at the very moment it loses one it gains another.

Of course, the shape of a piece of clay is an accidental form that doesn't make the clay to be *simpliciter*, but to be such and such. We grant this, which is why the clay example is an analogy. But what we want to insist on is this: if substances are such that they cannot exist unless characterized by one of a number of contingent accidents and yet can maintain their identity "underneath" such accidental changes, there seems no good reason to suppose that matter (1) cannot exist without being actualized by one of a number of substantial forms and yet (2) can be such that it can endure and maintain its identity underneath these substantial changes.

No doubt this way of understanding the issue may be somewhat at odds with Aquinas's own metaphysics since he often talks as if matter has no intrinsic being distinct from the being form conveys upon it. And if forms give matter its intrinsic being, it does not seem matter could change form, since identity and intrinsic being go together. As we understand it though, matter does have some intrinsic being of its own not conferred by form. But we think that this is consistent with supposing that matter needs to be actualized by some form simply to exist, and that being informed is such a necessary condition for matter's existing that not even God could conserve it in being while stripping it of all substantial form (much in the same way, or so it seems to us, that not even God could conserve a lump of clay stripped of every accidental shape). Understanding the relation between form and matter in this way seems to allow one to fashion a "middle way" between Aquinas's doctrine of prime matter and Suarez's, and this *via media* will make Aquinas's own teaching internally consistent without entailing that matter has so much intrinsic being that it becomes a sort of diminished substance.

Before continuing, we wish to note that this modification of Aquinas's hylomorphism will allow us to solve a difficulty in Aquinas's teaching bearing on the disposing accidents we mentioned in the last section. According to Aquinas's own teaching, when a substantial change occurs all the accidents of the old substance are destroyed along with that substance, since with the destruction of the substance accidents lose their sustaining substratum. But this seems to make it impossible for matter to be gradually disposed to receive a new form. If fire indisposes the matter in some wood for the form of the wood while simultaneously disposing it to receive the form of ash, then it seems that the "ash-disposing accidents" must be present in the matter at the moment the substantial form of ash is educed in the matter. If, however, all the accidents of the old substance cease with the corruption of that substance, even those accidents introduced by the fire into the matter of the wood, then accidents making it indisposed to the form of the wood and disposing it for the form of ash must simply vanish with the destruction of the wood—hence they will be unable to dispose the matter that was in the wood for information by the ash form.

But on the view here propounded this difficulty vanishes. If prime matter, though requiring to be informed by some substantial form to exist, nevertheless has enough intrinsic being to retain its identity during a substantial change, it seems it has enough to retain certain accidents while undergoing the change and hence to provide the incoming substantial form with the material dispositions necessary for that form's eduction, so long, that is, as there is no time lag between the corruption of the old form and the introduction of the new form. To return to our clay analogy, the clay may retain the same color or texture even while losing and gaining new shapes.

Even granting all this, however, one might suppose that the modification of Aquinas's hylomorphism we are suggesting still suffers from positing circular causality, since it still holds that matter cannot exist without being informed by some substantial form and that a substantial form cannot exist without informing matter. Aquinas himself has considered this objection in many places, and his response is that causes of different kinds may each be prior to the other with respect to different kinds of causal dependency. He thinks this is true both for the efficient and the final cause, and the formal and the material cause. Thus, in his commentary on Aristotle's *Metaphysics* he wrote:

The efficient cause is the cause of the final cause inasmuch as it makes the final cause be, because by causing motion the efficient cause brings about the final cause. But the final cause is the cause of the efficient cause, not in the sense that it makes it be, but inasmuch as it is the reason for the causality of the efficient cause. For an efficient cause is a cause inasmuch as it acts, and it acts only because of the final cause. Hence the efficient cause derives its causality from the final cause. And form and matter are mutual causes of being: form is a cause of matter inasmuch as it gives actual being to matter [i.e., it gives it the substantial determination necessary to exist], and matter is a cause of form inasmuch as it supports form in being [i.e., provides it with a substrate]. (Aquinas 1961, 308 [*Commentary on the Metaphysics of Aristotle*, Vol. I, Book V, L. II])

Objection 3: Aquinas's hylomorphism violates the principle of the excluded middle.

To see the force of this objection recall that, according to Aquinas, a composite substance can be made neither of other substances nor of accidents. But since for Aquinas a substance is that which if it exists, does not exist in another, and an accident is that which if it exists, does exist in another, it should immediately be apparent that Aquinas's prime matter is an entity which, if it exists, neither exists in another nor not in another. And that is a problem.

One might defend Aquinas here by biting the bullet, so to speak—other thinkers than Aquinas, including some contemporary physicists, have held that certain realities violate the principle of the excluded middle.

But we confess we find the a priori appeal of the principle of the excluded

middle to be very strong and so we prefer to make a further modification of Aquinas's hylomorphism to make it consistent with that principle. This can best be achieved by drawing a distinction between a subject and a substance. Earlier we said that Aquinas defined a substance as an essence such that if it exists, it cannot exist as a state of another. But let us now take this as defining a subject, and modify Aquinas's description of a substance as follows:

Something is a substance iff it (1) is a subject and (2) has active powers (i.e. powers to produce new accidents in itself or new forms in another subject).

Notice that this definition entails that all substances are subjects, but does not entail that all subjects are substances.

Having distinguished subjects from substances we can modify Aquinas's hylomorphism by holding that prime matter is a non-substantial subject and that a substantial form is a form that inheres in such a subject while an accidental form is a form that inheres only in a subject that is a substance. So modified, Aquinas's hylomorphism does not violate the principle of the excluded middle.

6 Conclusion

We have just posed and replied to three specific objections against hylomorphism. But even if our brief defense of a modified Thomistic hylomorphism convinces some that hylomorphism might be able to be made internally coherent and consistent with science, most even of those readers will think we are reviving a battle decided in the 17th century.

In response we wish to say two things.

First, Aquinas's argument for hylomorphism is metaphysical and rests on powerful principles concerning the conditions necessary for change and for a substance to be one thing, and he was driven by these arguments to disagree with those medieval thinkers who held that the elements are actually or really present in compounds (e.g. there is earth, air, fire, and water in humans). According to Aquinas they can only be present in such compounds virtually; that is, "elemental accidents" are present in compounds but not the elements themselves. We have seen why he held this—any combination of actually existing substances can, at most, only produce a particularly tight union of a number of substances, not something per se one. Replacing the ancient elements with the micro-particles (or strings!) of contemporary physics doesn't appear to us to weaken whatever force Aquinas's arguments have always had—one might as well refute Berkeley by kicking a rock! If it makes sense to say the four elements remain only virtually in compounds, why doesn't it make sense to say that micro-particles do? Indeed the very odd and unstable nature of contemporary micro-particles might make them better candidates for virtual presence in compounds (i.e. macro-objects) than the rather more solid ancient elements.

Secondly, it just isn't the case that the physics that arose in the 16th and 17th centuries, or the philosophy that was inspired by it in England and France, ever really solved the problems hylomorphism was meant to solve. What happened, in general, was that scientists and philosophers forgot about those problems (along with others—for example the problem of universals). This forgetfulness didn't occur as quickly in Germany where the influence of Leibniz, the most scholastic of the early modern philosophers, continued to be felt for decades. But after Kant, many came to believe that the critical philosophy didn't so much *solve* these "hylomorphic problems" as it *dissolved* them. And in the early 20th century Kantianism and positivism united in their opposition to classical metaphysical problems. But the time is long past when one can dismiss classical metaphysical problems with a wave of the Kantian-positivist wand. Since the 1950s the older problems of metaphysics have arisen again and robust theories of universals, possible worlds, trans-world identity without or without individual essences, and states of affairs have been fashioned. And more recently metaphysicians have started to grapple again with hard questions concerning the nature of substantial vs. accidental change and the unity of material substances (the problem of "material constitution" as it is now called). Since hylomorphism was fashioned to address these questions, it is not surprising that admittedly neo-Aristotelian theories have been created to answer them. So far, the contemporary neo-Aristotelians have not been so intrepid as to re-introduce prime matter or substantial form. But robust analytic metaphysics is still in its youth and David Wiggins, the most prominent of the current crop of neo-Aristotelians, has acknowledged that the problem of the continuant in substantial change is a real and deep one and that his own neo-Aristotelian theory offers no answer to it.³¹ The time may come when analytic metaphysicians take hylomorphism seriously again.³²

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³¹ Wiggins, 2001, 67–68, note 8.

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