Contemporary Functionalism and Aristotle’s Theory of Mind

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ABSTRACT

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Contemporary Functionalism and Aristotle’s Theory of Mind

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Since the emergence of functionalism commentators like Nathaniel Goldberg have argued, against charges of anachronism, that Aristotle merits the title of “philosophy’s first functionalist.” It is against this view that my paper is written. In his work “Is Aristotle’s Philosophy of Mind Functionalist” Goldberg begins his argument by urging that just as modern functionalism can be read as a response to Cartesian dualism, so Aristotle’s philosophy of mind can be read at least partially as a response to what he saw as the shortcomings of Platonic dualism. However, in part one I argue that since Aristotle’s philosophy of mind sits squarely within, and is an expression of, his hylomorphic theory of nature, it follows that there is nothing that can distinguish it as the source of a reaction to any alleged difficulties with Plato’s ontology. Thus I contend that Aristotle’s attempt to construct an ontology as a successor to Plato’s is reflected not in his philosophy of mind, but his theory of nature itself with respect to scientific explanation.

In part two I investigate not the motivations for Aristotle’s philosophy of mind (and biology generally) but the content itself to determine if Aristotle can legitimately be read as a functionalist. I conclude that his concept of actuality (energeia) prohibits such an interpretation, for it far outstrips the basic “structural” meaning Goldberg assigns it, thus revealing a markedly anti-functionalist strain of Aristotle’s thought. A certain kind of substance, according to Aristotle, must be composed of a certain kind of matter in order to be the thing that it is.
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PART I

It is said that, in his time, Aristotle was known as the man who knew everything. While admittedly hyperbolic, this designation is surely telling of the range and depth of Aristotle’s thought, which since his time has served as a major touchstone of philosophical discourse; modern philosophy, it seems, is well in his debt. But to what extent exactly? What does, say, contemporary philosophy of mind owe Aristotle? Beholden as it now is to the physical sciences, modern philosophy of mind appears to have long outstripped the theoretical resources available to Aristotle’s time. Further, the opinion among many scientists that Aristotle’s teleology fundamentally stymied the development of modern scientific procedures has become dogma. Despite these differences, however, a number of interpreters share the conviction that the advent of functionalism in the mid-twentieth century marks a realignment of modern and ancient thought. They hold that, far from being a source of misguidance, Aristotle’s work in fact prefigures contemporary philosophy of mind.

In his work “Is Aristotle’s Philosophy of Mind Functionalist?”, Nathaniel Goldberg argues in favor of this position, claiming that Aristotle merits the title of ‘philosophy’s first functionalist.’ At his argument’s outset he states that although his project may hold suggestions of anachronistic reasoning, nevertheless at least one point serves to legitimate his purpose: he alleges that just as modern functionalism can be read as a response to Cartesian dualism, Aristotle’s philosophy of mind “is at least partially an attempt to find a scientific successor to Platonic dualism.” Thus, in connecting Cartesian dualism with its supposed historical counterpart, Platonic dualism, Goldberg takes

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himself to be avoiding anachronistic error by insisting that both modern-day
functionalists and Aristotle share a common problem in their pursuit of explaining the
mind/soul: how to explain the soul/mind’s relation to body (Goldberg, 47-48). For all his
efforts, however, I argue that his position is unfounded and does more to distort, rather
than illuminate, the motivations as well as the general picture of Aristotle’s natural
philosophy.

Goldberg’s claim that Aristotle’s philosophy of mind is at least partially a
response to Platonic dualism forms the focus of my critique. This is so in spite of the
qualifying phrase, “at least partially,” for I argue that since Aristotle’s philosophy of
mind sits squarely within the rest of his theory of nature—and hence introduces no
theoretical difficulties against it—it follows that there is nothing that can distinguish it as
the source of a reaction to any alleged difficulties with Plato’s ontology. Thus I contend
that Aristotle’s response to Plato is reflected not in his philosophy of mind, but in his
theory of nature itself with respect to wider considerations of causation and explanation.
In arguing the contrary, Goldberg’s view not only loses sight of the mind’s fully
explicable character within Aristotle’s nature, but also falls prey to anachronism by
suggesting that Aristotle was concerned to solve the mind/body problem. If we are to take
seriously the idea that Aristotle is indeed philosophy’s first functionalist, we must look
for reasons that keep Aristotle’s scientific commitments in full view.

What was Aristotle’s philosophy of mind? From a historical perspective this
question may strike one as odd. For philosophical research on the mind has been, and
remains, devoted to resolving the cardinal problem of substance dualism as articulated by
Descartes. In supposing that Aristotle had similar ambitions, the question appears to fall
into anachronistic error by its very utterance. Avoiding these errors means understanding not only what Aristotle has to say about the mind, but also understanding how his own ambitions to explain nature inform what he has to say about the mind.

Aristotle and Causation

For Aristotle, like many ancient authors, the phenomenon of natural change stood paramount as *the* metaphysical problem crying out for explanation. Formulating a proper account of how a baby grows up to be an adult or how a seed transforms into a plant had generated a welter of speculation among theorists, ranging from Parmenides’s denial of the existence of change to Heraclitus’s insistence that change—or process—exhausts the entirety of being; all of which, according to Aristotle, failed to deliver a plausible solution. His own approach to the problem is complex but issues from two key notions. The first is his theory of hylomorphism, the idea that perceptible substance are a composition of both matter and form. The second is his four-fold division of causation. As will be shown, Aristotle repudiates his predecessors’ methods of explanation—most relevantly, Plato’s—because they ignore causes crucial to a proper understanding of natural processes. Such explanations, for Aristotle, do not constitute scientific knowledge.

The treatment of causal principles as the source of scientific knowledge has a reverberating presence in Aristotle’s work. In his *Physics* he asserts, “Men do not think they know a thing till they have grasped the ‘why’ of it (which is to grasp its primary

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2 Form, matter, and form’s privation are identified as the three principles that enter into Aristotle’s explanation of change. (*Physics* i 7).
cause)” (*Physics* ii 3, 194b18-20); and similar pronouncements occur elsewhere.³ The causal principles Aristotle has in mind are the familiar material, efficient, formal, and final, which are outlined immediately following the above-quoted passage. Adopting the classic bronze statue analogy, each principle contributes to scientific explanations in the following way: the material cause (‘that out of which a thing comes to be and which persists’) refers to the bronze of the statue; the efficient cause (‘the primary source of change or rest’) refers to that which made the statue; formal causation (‘the what it is to be something’) identifies the form or shape of the statue; lastly, final causation (‘that for the sake of which a thing is done’) indicates the reason for the statue’s construction. All four causes, being operative in all occurrences of natural change, are thus necessary for a complete explanation of such change.⁴

An additional point must be made. Speaking of knowing the ‘why’ of a thing in the passage above, Aristotle cites a *primary* cause. This sense of ‘primary’ is not mere rhetoric, but has technical significance in specifying the exact kind of cause belonging to a complete causal explanation. In order to qualify as genuine knowledge, Aristotle urges that it is not enough to identify all four causes at work in a given explanation. What the student of nature is in search of are specifically *intrinsic* causes, as distinguished from *incidental* causes. Aristotle outlines this distinction by analogy to the building of a house:

> For just as a thing is something either in virtue of itself or accidentally, so may it be a cause. For instance, the housebuilding faculty is in virtue of itself a cause of a house, whereas the pale or the musical is an accidental cause. That which is *per

³ *P.A.* ii 11, 94a20-3; *P.A.* i 2, 71b29-31; *Meta* i 3, 983a25-6.

⁴ The four causes are applicable only to substances. Aristotle’s application of them to artifacts is only for the purpose of illustrating their correct application to substances.
cause is determinate, but the accidental cause is indeterminable; for the possible attributes of an individual are innumerable (Physics ii 5, 196b24-29).

Here Aristotle refers to intrinsic and incidental causes respectively as *per se* and accidental causes. The reason why accidental causes, strictly speaking, are not explanatory is because they are not central to the operations of nature—i.e., they do not occur always or for the most part. Free of this condition, accidental causes are, as Aristotle tells us, “indeterminable” and “innumerable.” Accordingly, if we were to admit a builder’s paleness or musical skill as intrinsic causes of the building of a house, we would be forced to admit countless others—e.g., being tall, literate, and so on. Unlike accidental causation, intrinsic causation operates regularly in nature. The construction of a house, then, occurs by the intrinsic cause of a housebuilding faculty in the builder(s), and this cause may itself be accompanied by an indefinite variety of incidental causes—in this respect the former is prior. As a final point, incidental and intrinsic causation may jointly constitute any one of Aristotle’s four causes. This is the explanatory schema proper to all investigations of nature. A brief sketch of Plato’s metaphysics will show what little application this schema has to his theory of nature, and consequently the scale of Aristotle’s dissatisfaction with his teacher’s account of scientific understanding.

**Plato’s Metaphysics**

Discussing Plato’s theory of nature once again summons the specter of anachronism. How did Plato conceive of nature? Certainly far differently than Aristotle,

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5 “Now the modes of causation are many, though when brought under heads they too can be reduced in number. For things are called causes in many ways and even within the same kind one may be prior to another… Another mode of causation is the accidental and its genera…” (Physics ii 3, 195a28-34).
and even more so with respect to its modern conceptions. His theory of forms, for which he is most remembered, is an outgrowth of a wider metaphysical theory set forth in his *Timaeus* that seeks to account for the world’s origins and humankind’s purpose for living. Plato holds that a divine craftsman, the Demiurge, gave order to a formerly chaotic universe by basing his creation on a model of perfect reality. On his account, the world can be divided into ‘that which is’ and ‘that which becomes,’ each characterized by an ontological and epistemic component: ‘that which is’ represents the world of intelligible forms and corresponds to understanding founded on truth, while ‘that which becomes’ signifies the world of material necessity and corresponds to understanding founded on opinion. What follows is that since the created world belongs to ‘that which becomes,’ any account of it (including creation stories) and its parts must belong to the class of opinions; thus they can only be *likely*—or verisimilar—stories (*Timaeus*, 27d5-28a4). On such a view, can we ever claim to genuinely grasp the causal structure of nature? Plato finds hope for this possibility in analyzing the teleological features of the world, features evincing purpose and perfection (*Zeyl*, xxviii-xxxiv).

But already we arrive at a striking incongruency between Aristotelian and Platonic epistemology, for Aristotle’s treatises lay heavy emphasis on the attainability of knowledge about nature’s principles. His *Physics* affirms that we can come to know natural objects in a maximal sense by coming to know the natures—defined as a “principle or cause of being moved and of being at rest” (192b20)—that they manifestly possess. Hence Aristotle would agree that if Plato’s cosmology is admitted then it will

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6 This distinction is also found in *The Republic* (518c, 534a).
7 In consequence, organisms, celestial bodies, the elements, and natural compounds—e.g., rocks—are categorized as natural entities while artifacts and accidental compounds are not.
invariably suffer a limited epistemology, but for reasons quite different from those advanced by Plato himself. The main reason a complete study of nature would fail on a Timaean account, according to Aristotle, is because the metaphysics of this account cannot be made amenable to an adequate scientific methodology. As will be detailed below, Aristotle maintains that only an incomplete scientific understanding can result by ignoring the explanatory methods supplied by his hylomorphism and four-fold theory of causation.

Plato’s Theory of Causation: Efficient and Final Causes

In his *Metaphysics*, Aristotle provides a critical summary of his predecessors’ views, placing Plato’s theory of causation front and center. Chief among its problems is the fact that it omits the operations of final and efficient causation. Aristotle writes that “[Plato] only employed two kinds of cause, the principle of the what and the material cause” (Taylor, 105). Plato employs his famously obscure concept of the ‘receptacle’ to account for material causation, while employing his intelligible forms to account for formal causation—or the what-ness of a thing—and thus can explain the material constitution as well as the defining essence of an object. But, critically, he has nothing to say about an object’s principle of motion or *that for the sake of which* it exists.

Concerning the latter, this is puzzling. For as noted, teleological principles have a central importance in Plato’s cosmology—the world is created to be the best it can possibly be, and hence everything has a purposive order and arrangement. However, Aristotelian teleology does not start from a point over and above nature with the aim of bringing all things into neat and cohesive relation with one another in the name of achieving the
superlative ‘Good.’ Rather, it starts from within natural objects themselves and acts only in accordance with what is good for the object. Aristotelian teleology, contrary to Plato’s, is individuated to things that have natures.\(^8\)

This aspect of Aristotle’s natural philosophy dovetails with his proposed solution to the question of how Plato’s “Ideas” can causally influence the sensible world in the manner of efficient causation. For Aristotle is at pains to understand how this influence is assignable to intelligible forms: “One might discuss the question what on earth the Forms contribute to sensible things, either to those that are eternal or to those that come into being and cease to be. For they cause neither movement nor any change in them” (Meta i 9, 991a9-11). In a subsequent paragraph he continues, “The [Ideas] are causes of both Being and Becoming; yet when the [Ideas] exist, still the things that share in them do not come into being, unless there is some efficient cause” (991b3-5). Clearly Aristotle is zeroing in on an explanatory gap between Ideas and sensible objects. In the same way he rectifies a mistaken teleology, Aristotle wishes to bring efficient causation down to the level of the individual by investing all natural objects with a formal nature which acts as a principle of motion and rest. It is only through the incorporation of teleological and efficient causes that Aristotle thinks Plato has any hope of attaining a genuinely causal understanding of nature.

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\(^8\) This point is stressed in numerous works: “Nature creates nothing without a purpose, but always the best possible in each kind of living creature…” (IA i 704b15-16); “A man has such and such parts, because the essence of man is such and such, and because they are necessary conditions of his existence, or, if we cannot quite say this then the next thing to it, namely, that it is either quite impossible for a man to exist without them, or, at any rate, that it is good that they should be there” (PA i 1, 640a34-37); “If then it is both by nature and for an end that the swallow makes its nest and the spider its web, and plants grow leaves for the sake of the fruit and send their roots down (not up) for the sake of nourishment, it is plain that [final causation] is operative in things which come to be and are by nature.” (Physics ii 8, 199a26-30)
In the preceding section I have argued that Aristotle’s disagreement with Plato’s study of nature lay principally in the fact that missing from Plato’s account are efficient and final causes. But how do material and formal causes fare in Plato’s cosmology? Did Plato, despite some confusion, at least get these right? In the next section I argue that although Aristotle grants that Plato was right to seize upon material and formal causation in his analysis, still he holds that these are at best examples of incidental causation. Thus even they cannot serve the demands of Aristotle’s scientific methodology.

Plato’s Theory of Causation: Material and Formal Causes

As I’ve indicated earlier, Plato’s *Timaeus* describes the cosmos as the handiwork of the demiurge. With this, Plato concludes that it stands to its creator as a work of art stands to an artist. In the present context the import of this analogy cannot be overstated, for the entirety of Aristotle’s nature rests on the notion that productions of art, which lack natures, are always secondary to the productions and activities of nature itself. That is, art may provide a useful analogy to understand natural processes, but the latter must be given ontological primacy. For Plato, however, nature itself is a kind of artwork. Such a view of nature is unacceptable to Aristotle for reasons spelled out by Monte Johnson: “The artist makes everything for the sake of the whole, and on the scale of the universe this means that everything in the cosmos exists for the whole world; the individual or ‘part’ has its good only in relation to the whole” (p. 123) Adopting Plato’s view, *that for the sake of which* a natural entity exists will not derive from its own essence—it will no

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9 “A bed and a coat and anything else of that sort, *qua* receiving these designations—i.e. in so far as they are products of art—have no innate impulse to change.” (*Physics* ii 1, 192b16-18)
longer be a thing that strives for its own good—but an indistinct good external to it. Final causation is clearly not serviceable on Plato’s artistic model of the cosmos.

More importantly, a failure of final causation translates to a failure also of formal (and efficient) causation as a result of their interconnectedness in structuring the activities a thing’s life processes. Aristotle tells us that “since nature is twofold, the matter and the form, of which the latter is the end, and since all the rest is for the sake of the end, the form must be the cause in the sense of that for the sake of which” (*Physics* ii 8, 199a30-33). By suggesting that form must be the end, this passage gives a first impression that Aristotle intends to assimilate one cause to another or perhaps make a statement of identity. However, he is rather pointing out the interrelational, and some times overlapping, properties that causal principles exhibit within a natural entity, most saliently organisms. The end of an organism is directed and informed by that thing’s formal nature. Thus asking why, say, humans have the capacity to reason refers to both formal and final causation, where the dividing line between the two is not always clear. The capacity to reason is definitive of what it means to be human, but since it also enables humans to achieve the good for themselves it therefore entails teleological considerations as well. Since on Aristotle’s view Plato’s account lacks a teleological good that is specific to each kind of organism, he holds that Plato’s theory of forms must also be mistaken; formal causation, after all, largely directs a living thing towards specified ends.  

Thus, Aristotle holds that Plato does endorse a mode of formal causation, but it is not the intrinsic mode necessary for scientific explanation.

10 Johnson nicely summarizes the main problems afflicting Plato’s account: “It is because Plato’s prioritization of art over nature, and his specification of the cause for the sake of which with reference to
A closer inspection of how Plato employed the idea of material nature will likewise discount it as a source of intrinsic causation. As mentioned, Aristotle takes perceptible substance to be a compound of form and matter, whereas Plato understands substance to consist of matter alone, embodied in what he calls the ‘receptacle.’ As mere potentiality, Aristotle dismisses the possibility that matter by itself is sufficient to account for the being of an object. What must also be present, he argues, is actuality—i.e., form. In his *On Generation and Corruption*, Aristotle makes this case specifically against Plato’s *Timaeus*:

> But those thinkers are in error who postulate, beside the bodies we have mentioned, a single matter—and that a corporeal and separate matter… And what Plato has written in the *Timaeus* is not based on any precisely-articulated conception. For he has not stated clearly whether his [receptacle] exists in separation from the elements; nor does he make any use of it. He says, indeed, that it is a *substratum* prior to the so-called elements. (II 1, 329a8-17)

Aristotle’s worry concerns a material substratum existing prior to Plato’s elements as an ontologically independent thing. In the language of Aristotelian physics, this amounts to the unacceptable possibility of potentiality existing *actually* without its actualization via some form. As Margaret Scharle concludes, “Plato’s mistake (like that of Anaximander) was to make the receptacle into a separate natural substance. Aristotle suggests that Plato’s receptacle should not be taken as a separate natural substance, but as an ultimate
material *principle* and as a principle, it is not ‘separate’, but always bound up with a contrariety’ (p. 34). Contrarieties, she notes, are understood to be forms. It follows that Plato’s material principle, despite having won partial acceptance from Aristotle, cannot qualify as substance and is therefore all the more unqualified to act as an intrinsic cause in nature.

Throughout the course of this discussion I have been slowly amassing and expounding the major facets of Aristotle’s science of nature by drawing attention to what were for him the most misconceived aspects of Plato’s treatment of the subject. Aristotle is in pursuit of a study of nature that affords genuine causal knowledge of the world by uncovering the causal principles that reside within natural objects and govern their development. The essential features of Plato’s cosmology prohibit such an analysis, confining it both in the number and modes of admissible causes. A construction of a legitimate and explanatory science, irrespective of its implications for a philosophy of mind, thus formed the object of Aristotle’s scientific aspirations. However, at this juncture an objection immediately presents itself. Might it be that although considerations related to the mind are not the focal point of Aristotle’s science, they nevertheless lie somewhere along its margins? Might they at least minimally motivate Aristotle’s anti-Platonic science, this being, after all, the whole extent of Goldberg’s thesis? Despite the modesty of the proposal, I argue in the following section that Aristotle’s interpretation of mind cannot be singled out in any way as a direct outcome of his unease with Plato. The impossibility of this task is made apparent by elucidating how Aristotle’s interpretation of mind relates to the soul, and in turn how the soul relates to the whole of nature.
Aristotle and the Soul

In the opening book of his De Anima, Aristotle notes an intimate connection between the soul of a living body and the natural world: “The knowledge of the soul admittedly contributes greatly to the advance of truth in general, and, above all, to our understanding of Nature, for the soul is in some sense the principle of animal life” (402a5-7). It may be thought that knowledge of the soul, later defined as a starting principle (arche), can further our understanding of nature through an examination of it simply as a source of originative movement, as the thing that moves the body in accordance with the behavioral traits unique to its species.\textsuperscript{11} While this thinking is in a sense correct, it rests on the mistaken assumption that soul and body are distinct entities with the implication that the soul exists apart from nature. Further, it fails to do justice to Aristotle’s wider interpretation of the soul as integral to, or a manifestation of, hylomorphic nature.

Dealing first with the relation of body and soul, Aristotle hints at their possible unity in the sentence immediately following the one quoted above. Of the soul’s properties he asserts, “Some are thought to be affections proper to the soul itself, while others are considered to attach to the animal owing to the presence of soul.” Notably, Aristotle does not draw a distinction between the soul and body, but between the soul and the body-and-soul. Thus there already appears to be a denial of an organism existing without soul; whatever living is, it requires soul. But this goes little ways in determining if the soul and body (assuming this to be a coherent distinction) are strictly speaking one thing. Further on in De Anima Aristotle casts a light in this direction by asking how

\textsuperscript{11} ii 1, 412b15-17.
The affections of the soul are to be appropriately studied. Granting that the soul and body are inseparable, Aristotle asks if affections can be ascribed only to the soul and thus studied separately from body, or if they must be ascribed to soul-and-body? He concludes with the latter, noting that “in all [affections] there is a concurrent affection of the body” (403a18-19). From this position, Aristotle gives a clear statement affirming the unity of soul and body in book II: “That is why we can dismiss as unnecessary the question whether the soul and the body are one: it is as though we were to ask whether the wax and its shape are one” (412b5-7). Hence, on Aristotle’s interpretation the soul and body, as a unity, exist as a part of nature.

But to conclude this of the soul simply in virtue of its relation to body—as an ipso facto material thing—would be misleading, for it assumes a notion of matter already rejected by Aristotle. The real reason the soul marks no divergence from nature is because, in the spirit of hylomorphism, the soul is an actuality of a material potentiality. Defined as an “actuality of the first kind of a natural body having life potentially in it,” the soul is the form of a living body whose material composition is such that it can accept a certain kind of form (412a27-28). “Actuality of the first kind” here means a capacity to perform a function, as opposed to the second kind of actuality in which a function is actively being performed. The soul is that which actualizes the body, endowing it with the capacity to perform the functions (nutritive, locomotive, perceptual, and rational) characteristic of that kind of body. On this account, then, organisms are analyzable as

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12 “If there is any way of acting or being acted upon proper to soul, soul will be capable of separate existence; if there is none, its separate existence is impossible. In the latter case, it will be like what is straight, which has many properties arising from the straightness in it, e.g. that of touching a bronze sphere at a point, though straightness divorced from the other constituents of the straight thing cannot touch it in this way; it cannot be so divorced at all, since it is always found in a body.” (403a10-16)
substance just like any other thing. Their structure, as matter and form, is in an important sense reflective of the matter-and-form structure characterizing the whole of nature, and thus so is Aristotle’s prescribed method for their study. Indeed, Aristotle characterizes the methods undertaken by the student of nature, treating of both matter and form, as most proper to the study of living beings. These methods apply not least to the capacities in which Goldberg finds evidence for his functionalist view, for example perception. In truth, however, an organisms’s capacity for perception is paradigmatic of hylomorphic processes. Eyes, for instance, allow one to see by receiving the form (and not the matter) of an object of perception. The matter of the eye, and every other perceptual organ, is uniquely structured to accept the form of those objects suited for its perception. Aristotle asserts that “what has the power of sensation is potentially like what the perceived object is actually” (418a3-4). In hylomorphic terms this means that organs of perception, which instantiate a capacity of soul—i.e., they exist as a first actuality—become instantiations of second actuality when they assume the form of external objects. By actualizing the form of the object perceived, the matter of the organ actualizes its own capacity to perceive.

What is more, this applies to affections like courage, pity, joy, etc., phenomena that constitute an intractable subject matter for the materialism of today. Aristotle’s science, however, brings these squarely within the domain of his causal framework, rendering them unproblematic: “Anger should be defined as a certain mode of movement

13 “Hence a physicist would define an affection of soul as differently from a dialectician; the latter would define e.g. anger as the appetite for returning pain for pain, or something like that, while the former would define it as a boiling of the blood or warm substance surrounding the heart… Which, then, among these is entitled to be regarded as the genuine physicist? The one who confines himself to the material, or the one who restricts himself to the account alone? Is it not rather the one who combines both?” (403a29-403b8)
of such and such a body (or part or faculty of a body) by this or that cause and for this or that end. That is precisely why the study of the soul—either every soul or souls of this sort—must fall within the science of nature” (i 1, 403a26-29). Thus we have a further indication of the strong lines of continuity between the soul and nature. From the standpoint of causal understanding, the operations of soul and its affections manifest the wider array of phenomena in nature as a result of their hylomorphic framing. What remains to be considered is if the same can be said of the rational faculty of soul.

Thus far I have demonstrated how Aristotle develops the idea of the soul as a continuation of his wider understanding of nature, bringing the discussion to bear on the claim that, unlike the faculty of perception, Aristotle’s rational faculty is distinguishable as an effort to overcome the peculiarities of Plato’s worldview; that, in effect, this faculty marks the conclusive break with nature required of Goldberg’s contention about Aristotle’s model of mind. But in examining this model we find that Aristotle applies the same hylomorphic reasoning to the rational faculty as applied to the perceptual faculty.

Defined as nous, or “the part of the soul with which the soul knows,” the rational faculty is suitably structured to receive the intelligible form of an object of thought. After defining it, Aristotle says that nous must be “capable of receiving the form of an object; that is, must be potentially identical in character with its object without being the object. Thought must be related to what is thinkable, as sense is to what is sensible”(DA iii 4, 429a10-18). The organ of thought receives the form of its object in the same way that the organ of perception receives the form of its object. However, on this point we approach a

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14 Since Aristotel’s theory of causal explanation applies only to substances, anger cannot, strictly speaking, be explained by reference to Aristotle’s four causes. Anger therefore has the same explanatory status as does a bronze statue.
difficulty. For Aristotle goes on to deny that any such organ can exist, directly contravening his earlier insistence that for any existing function of the soul there exists a corresponding part of the body: “That in the soul which is called thought (by thought I mean that whereby the soul thinks and judges) is, before it thinks, not actually any real thing. For this reason it cannot reasonably be regarded as blended with the body” (429a23-25). By this statement Aristotle effectively confirms what he has formerly only alluded to in several places discussing nous, namely that it is separable from the rest of matter. Thus, a rift seems to emerge between Aristotle’s theory of hylomorphism and his theory of the mind, disrupting the continuity I have been pushing for all along. My purpose here is not to reconcile this theoretical discrepancy, but instead to point out two reasons why it poses no threat to my argument.

The first is that despite the difficulties that nous brings to bear on Aristotle’s hylomorphism, it is clear that he nevertheless strives to cast it and its functions in hylomorphic terms. Aristotle’s use of hylomorphic concepts pervade his study of the mind no less than his study of perception. The fact that he is willing to see his theory of hylomorphism all the way through, even as it leads to untoward consequences, I think speaks to its indispensability for his science. The second reason concerns how Goldberg’s thesis can possibly avail itself of the unusual character of nous. That is, how its discontinuity with the rest of nature mark it as the one aspect of Aristotle’s philosophy of mind not neatly derivable from a broader hylomorphic model, and hence the one faculty that has the hope of underwriting Goldberg’s proposal that his philosophy of mind constitutes a partial response to Platonic dualism. However, this cannot be the case for very straightforward reasons. If Aristotle’s theory of mind was premissed on an intention
to combat Plato’s dualism, even in part, then it would make no sense for him to begin this project with a faculty which immediately undermines his purpose—the dualistic faculty of *nous*.\textsuperscript{15} In sum, Goldberg’s central claim gains no ground even if it is granted that the concept of *nous* cannot be integrated with hylomorphism.

The picture of Aristotle’s philosophy of mind that Goldberg asks us to embrace is distorted by a failure to acknowledge Aristotle’s most basic scientific commitments. Goldberg implicates Aristotle in a search to circumvent the dualism of Plato by suggesting that his efforts are the antecedents of modern functionalism’s efforts to circumvent the dualism of Descartes.\textsuperscript{16} Goldberg interprets Aristotle to be dissolving Plato’s distinction between body and soul, thereby carving out a middle space between the materialism of Democritus and the dualism of Plato, in the same way that functionalism purportedly inserts itself between identity theory and Cartesian dualism. However, even if it were the case that Aristotle’s philosophy of mind set its sights on the mind/body problem, it nevertheless remains that the perceptual and rational faculties exhaust neither the full capacities of soul nor its import as the principle of life. At any rate, I have argued that there are stronger, independent reasons for believing that Aristotle’s treatment of the mind does not reflect a desire to solve the mind/body problem. Aristotle’s main project extends much further, designed to bring humans into direct acquaintance with nature by examination of its causal mechanisms. His hylomorphic model frames the bigger picture of nature in terms of actuality and potentiality, just as it frames the capacities of soul. The mind, constituted by those

\textsuperscript{15} Here I use the concept “dualism” loosely, following Goldberg’s usage.

\textsuperscript{16} For a dissenting opinion, see Olshewsky’s “Functionalism Old and New,” in which he argues that functionalism does not arise as a direct response to the problems of Cartesian dualism, but rather leads to them.
capacities, is thus a mere extension of Aristotle’s hylomorphism, not a challenge to dualism.
PART II

In the foregoing I have argued that it can only be a product of anachronistic reasoning to suppose that Aristotle’s account of the mind is rooted in an effort to combat Plato’s dualism of soul and body, and thus, at least as far as its central motivations are concerned, stands as modern functionalism’s historical analogue.\(^\text{17}\) While in this narrow sense I have cast my doubts as to whether Aristotle can lay claim to being philosophy’s first functionalist, I have left the subject largely untouched, urging only that we have been led astray if we think he held the same motivations as modern functionalists. The question if Aristotle was a functionalist finds its attraction among interpreters primarily in Aristotle’s method of defining a living thing’s bodily organs in terms of their functional roles. Goldberg hastens to bring this fact into the service of his argument. In doing so he insists that functionality, in the style of modern functionalism, exhaustively accounts for the being of any given organ. In other words, there is nothing else to what it is to be an organ than to successfully perform a given function. The effect of painting Aristotle’s natural philosophy with this modern brush is to mistakenly exchange notions of actuality in favor of causal-mechanical processes and potentiality in favor of functional organization, as will be explained. As we have seen Aristotle’s anti-reductionism brings with it concepts qualitatively unlike those employed by not only modern functionalism in particular, but physicalism in general. Thus in the following I take issue with Goldberg’s efforts to read Aristotle as suggesting that in defining the organs of the body and the human form itself, an analysis of functional organization may exclude all other

\(^{17}\) It seems the strongest historical parallel that we can draw is one of anti-reductionism. I hesitate to add “materialism” to this description because it would misrepresent the hylomorphic paradigm in which Aristotle is working.
considerations. I regard this as another casualty of his failure to fully appreciate the thrust of Aristotle’s hylomorphism, one that is laid bare by a closer examination of Aristotle’s concept of actuality. Goldberg’s aim is to demonstrate that those who reject his position simply attribute features to functionalism that are inessential to its core meaning. By reimagining functionalism’s central definition, Goldberg hopes to bring Aristotle into its fold. However, as his treatment of two particularly unwieldy passages shows, a reinterpretation of functionalism ultimately forces upon him a misinterpretation of Aristotle. Before taking this up, a brief description of functionalism and its relevant variants should be in order.

The Many Faces of Functionalism

Though it may be conceded that both functionalist and Aristotelian lines of thought originate from different quarters, it nevertheless seems to many that they unite at a common end. The suspicion is not at all unreasonable, for Aristotle’s formulation of soul and its corresponding bodily organs is highly suggestive. Defined in terms of a capacity, the soul is that which gives an organism life by enabling it to engage in the life-functions specific to its nature. More pointedly, Aristotle remarks that the functioning of an organ—as well as a body as a whole—has metaphysical significance, such that if its function were removed so too would its formal nature. The passage in De Anima that likens eyesight to soul is a favorite of readers like Goldberg: “Suppose that the eye were an animal—sight would have been its soul, for sight is the substance of the eye which corresponds to the account, the eye being merely the matter of seeing; when seeing is removed the eye is no longer an eye, except in name” (ii 1, 412b18-21). I will return to
this passage and others like it in due course. For now I only wish to underscore the pride of place that functional capacity enjoys in Aristotle’s writing and the temptation that naturally follows to associate Aristotle’s name with functionalism.

In the opening of his essay Goldberg cites Hilary Putnam’s declared indebtedness to Aristotle to further validate the direction of his argument. In a 1973 lecture Putnam credited Aristotle for anticipating what would come to be the basic principles of the functionalist outlook, saying, “What we are really interested in, as Aristotle saw, is form and not matter. What is our intellectual form? is the question, not what the matter is” (p. 247). This is noteworthy not only because Putnam was a leading champion of functionalism, but also because his statement exemplifies what is most problematic about debates that strive to classify a historical figure’s thinking. It is not enough to (1) successfully grasp the details and contours of Aristotle’s philosophy. One must additionally (2) determine if indeed his philosophy fits the bill of modern functionalism, and this further requires (3) univocality in how this concept is understood. As regards the latter Putnam’s remark is instructive, for the possible meanings it invites are many, and the questions it prompts concerning a fixed definition equally so. Is matter wholly negligible in offering a functional account or only mostly? Must the matter be of a specified kind? Is capacity to function a necessary or sufficient condition for the being of a thing? Putnam’s quote alerts one to the problem of semantics at play here, but, interestingly, leads by historical example as well. For although Putnam ties Aristotle’s name to functionalism, he later clarifies in a piece co-authored by Martha Nussbaum that he doesn’t believe Aristotle should be read along the lines of functionalism as he
conceives it. The fact that Goldberg nevertheless enlists his statement in support of his thesis is itself a case in point concerning a confused philosophical lexicon. Further complicating matters is his intention in the last section of his paper to rescue his thesis by clearing away “characteristics that [functionalism] does not need to have” (p. 48). Finally, add to this Putnam and Nussbaum’s view that despite falling wide of Putnam’s conception of functionalism, Aristotle is still characterizable as a functionalist! What is going on here?

The first step towards clarity involves distinguishing Putnam’s original formulation of functionalism, so called computational functionalism, from the one later put forth by both he and Nussbaum. Ned Block provides a helpful summary of Putnam’s thesis, echoed amply in the philosophical literature. According to Block “functionalists characterize mental states in terms of their causal relations, particularly, in terms of their causal relations to sensory stimulations, behavioral outputs, and other mental states” (p. 172). The innovation of Putnam’s functionalism, therefore, was in its method of non-reductionism. On his view, a brain state could not be reduced to the physical conditions that constitute it for the reason that it is the functional state we are interested in, not the physical state—as we would be in reductionist approaches like identity theory. In short,

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18 “Putnam also proposed a theory of his own as to what our organization to function is, one he has now given up; but this theory we did not, of course, attribute to Aristotle. This is the theory that our functional organization is that of a Turing machine.” (Words and Life, p. 46; italics mine)
19 Fortunately for my purposes it is not necessary for me to evaluate the defensibility of his reformulation. I am only interested in evaluating the consistency of its usage, whatever its content.
20 “We believe that our sort of ‘functionalism’ (the next section will show that Putnam now dissociates himself from functionalism for reasons that bring him even closer to Aristotle) is not only not committed to explanation ‘from the bottom up’, but is built on the denial of this possibility.” (p. 31)
21 As indicated in footnote 16, Putnam later came to renounce computational functionalism because it implied that for any functional state there was one assignable logico-mathematical formula characterizing it. Viewing this as reductionism in a new dress, he opted for a functionalism that was not only compositionally plastic but also computationally so.
we are interested in how causal inputs and outputs figure into what a physical state \textit{does}, not what it is made out of. It follows that computational functionalism entails compositional plasticity, the notion that functional states can be realized in a variety of different materials, human brains or otherwise. More precisely, it entails what I will call \textit{absolute compositional plasticity}, which, theoretically speaking, places no metaphysical constraints on the kind of material that can realize functional states. Hence, achieving a specified functional organization is both necessary and sufficient for the being—in Aristotelian terms, the ‘formal nature’—of a given thing. That is to say that any chunk of matter having the same functional organization of a human brain and capable of mediating the full complexity of each functional state’s inputs and outputs would for all intents and purposes be a brain. Moreover, since an indefinite range of mental phenomena are only realizable by an equally indefinite range of functional states, and since further these structures themselves are realizable only by causal-mechanical processes embedded in a materialist ontology, there is the additional stipulation that the theory presumes a Cartesian account of matter.\footnote{This is the atomistic conception of matter familiar to modern physics.} This is the functionalism Goldberg finds in Aristotle. Its features can be summed up as follows:

a. Absolute compositional plasticity (henceforth ACP)

b. Functionality is a necessary and sufficient condition of a thing’s formal nature (henceforth FNSC)

c. Requires Cartesian materialism

Compare this to the functionalism set out in Putnam and Nussbaum’s “Changing Aristotle’s Mind.” In this article they preserve the identification of Aristotle as a
forerunner of functionalism explicitly urged by Nussbaum in a former work, and, as noted, alluded to by Putnam. Accordingly, they take a broader approach with the intention of highlighting in Aristotle what they see as the basic functionalist impulse: assigning a greater value to form and function over material constitution. For their purposes of drawing a historical link from Aristotle to the present, it is enough to indicate this shared emphasis. Thus, their conception does not so much represent another variation of functionalism as it does a delineation of what is common to all variations. To this extent, then, it keeps a close kinship with the core of Aristotle’s theory. Putnam and Nussbaum, for example, are happy to admit compositional plasticity into Aristotle’s picture, but with limiting conditions. They agree, for example, that if an organ belonging to another species was transplanted into a human, then that organ would for all intents and purposes be a human organ given that it was capable of performing its assigned function. Where they depart from Goldberg is in their account of how the organ comes to realize its function. Though such thought experiments admittedly warp the fabric and original motivations of Aristotle’s theory, Putnam and Nussbaum hold firm to Aristotle’s key commitments by maintaining that however we imagine the functional realization of the organ occurring, it cannot be by the causal-mechanical operations of computational functionalism. To be sure, they are keen to avoid using the phrase “functional organization” because of its associations with computational functionalism;

23 “Aristotle accepts this move up to a point, apparently: for he seems to grant that in both cases there is a certain plasticity of composition. But he then distinguishes the cases. In the case of animals, to take away the matter is ‘to go too far—for some things just are this in this, or these in such and such a condition’ (1036β22 ff.). The point seems to be that although every actual sphere is embodied, the geometrical properties that make a sphere a sphere do not depend on the component materials’ having any particular properties, except perhaps a certain rigidity. The functional essence of a living being like an animal (whose essence it is to be a perceiving creature) does require mention of material embodiment, in that its essential activities are embodied activities.” (p. 43)
they instead prefer “organization to function.” Thus, the authors signal their faithfulness to Aristotle’s hylomorphism by refusing to take on board fundamental features of functionalism in their interpretation, a quality we find lacking in Goldberg’s analysis. But he is certainly under no illusion that Aristotle espoused a theory of matter altogether different from modern science. His analysis therefore speaks less to a profound misunderstanding of Aristotle’s treatises on nature than it does to the fact that the familiar often exerts an unconscious and prohibitive influence on attempts to conceptualize the unfamiliar. This fact reveals itself most vividly in two particular instances in Goldberg’s work. The first involves his treatment of actuality related to the functioning of the heart and the second of actuality related to the human form as a whole. In either case, were it not for a certain cognitive bias, Goldberg’s reasoning would remain arbitrary and unaccountable. Taking note of this helps not only to explain his interpretive methods but also his preoccupation with distinct facets of Aristotle’s theory and inattention to others.

The Hylomorphic Heart

Recall that Aristotle believes the proper study of the phenomenon of anger calls for the combined approaches of the student of nature/physicist and the dialectician. In defining anger, Aristotle tells us “the one gives the matter, the other the form. For this is the principle of the thing, but it must be in a matter of such and such a kind if it is to be”

24 “His opposition to materialist reductionism preserves the independence and irreducibility of the intentional and does not, as the modern functionalist would, seek to reduce these to independently specifiable computational states. There is no hint of any such enterprise (or even a desire for such an enterprise) in Aristotle; this is one reason why we prefer the phrase ‘organization to function’ to the more common ‘functional organization’, as more suggestive of the irreducible character of the intentional activities in question.” (p. 49)

25 For example the fact that his account of functional organization, concerning both the heart and body, stays at the highest level analysis. That is, it focuses on the matter qua heart or matter qua body, overlooking the numerous underlying levels. More will be said about this later.
(DA i 1, 403b1-3). Notably, his assertion that anger must be in a *matter of such and such a kind* has standardly been assumed to militate decisively against functionalist interpretations.\(^{26}\) The suggestion that if a function is to be realized certain material restrictions must first be met represents a clear violation of ACP. Goldberg therefore presents two ways of reinterpreting the text to avoid this difficulty, both of which involve reconceiving what the phrase *matter of such and such a kind* might mean in the given context. I will deal with each separately.

He first suggests that “Aristotle might be understanding the heart as that which, when heated, causes anger. Thus he would understand the heart functionally” (50). He proceeds to shore up his suggestion by drawing on the above-cited passage about the eye. Just as an eye is no longer an eye if it ceases functioning, so the contention goes, the heart is no longer a heart if it ceases functioning. Trading on functionality’s importance to being, Goldberg gives a mechanistic rendering to the heart. According to him the matter of such and such a kind refers to heated matter.

What is wrong with this reinterpretation? To begin with, it immediately makes trouble for Aristotle’s theory of causation as it pertains to the emotion of anger. For although Aristotle states that “anger should be defined as a certain mode of movement of such a body (or part or faculty of a body) by this or that cause and for this or that end,” his four-fold theory of causation is applicable only to substances, and anger does not meet this condition. Thus it would be wrong from the standpoint of scientific knowledge to say that the heart, in any respect, causes anger. Still, it is easy enough to imagine the kind of causal model Goldberg has in mind. We can therefore pursue this line

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\(^{26}\) That anger must be in a matter of such and such a kind is really an expression of Aristotle’s more fundamental idea of hypothetical necessity, explained most fully in *Physics* ii 9 and *PA* i 1.
of reasoning and see if it accords with the basic principles of Aristotle’s theory of causal explanation.

What would a causal model of anger look like? The material cause as the heating of the heart and the formal cause as a desire for revenge have already been mentioned. The efficient cause would be the occurrence, external or internal (such as a thought), that precipitates the anger. And since Aristotle gives no clear indication of what a final cause may be, this one can simply be ignored. Therefore, a model of causation for anger would look like the following:

- Material cause (potentiality): the heat surrounding the heart
- Formal cause (actuality): desire for vengeance
- Efficient cause: Occurrence that precipitated the anger

Goldberg no doubt intends to designate the heart as an efficient cause for anger. This presents a problem. On standard functionalist views it makes perfect sense to talk about the activities of brains, for example, in mechanistic terms. A mass of neurons can cause brain state \( x \) by virtue of its configuration and interplay of physico-chemical processes. There is no shortage of efficient causes in this functional system, but they are no doubt determinate and identifiable. Can Aristotelian causation similarly take on a multiplicity of causes? Yes, but that stops short of the main problem. Recall that Aristotle’s theory of causation draws its explanatory power from the distinction between

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\[27\] Aristotle describes these occurrences in the course of explaining that affections of the soul are always enmattered: “In all [affections of soul] there is a concurrent affection of the body. In support of this we may point to the fact that, while sometimes on the occasion of violent and striking occurrences there is no excitation or fear, on others faint and feeble stimulations produce these emotions, viz. when the body is already in a state of tension resembling its condition when we are angry. Here is a still clearer case: in the absence of any external cause of terror we find ourselves experiencing the feelings of a man in terror (\( DA i 1, 403a18-24 \)).
intrinsic and incidental causes. The latter may fill in the details for an explanation because they are related to the phenomenon in question, but their indeterminacy and potential innumerability mean that they are incapable of generating scientific knowledge (consider the already-mentioned example of the housebuilder). Intrinsic causes, on the other hand, are regarded as having a singular and determinate character. The only reason Aristotle allows a plurality of causes is because most of them are merely incidental and not strictly explanatory. Now the problem of Goldberg’s proposal comes into focus. If the heart is that which causes anger, it will fall under the category of either an incidental cause or an intrinsic cause. As an incidental cause the heart would fail to explain the anger it is supposed to produce. On the other hand, the view that it is an intrinsic cause fares no better, for it encroaches upon the condition that intrinsic causes are to be one, not many. Postulating the heart as an intrinsic cause of anger—as Goldberg presumably intends—in addition to the agent or event Aristotle himself cites represents an unacceptable case of causal overdetermination. Hence, considering the causal implications of Goldberg’s interpretation alone is enough to show its incompatibility with Aristotelian causation.

A closer look at the issue reveals that the additional cause Goldberg proposes is but a piece of the greater superfluity characterizing his interpretation here. He goes above and beyond to make what is a straightforward hylomorphic point into something more recognizable to modern eyes. But if we take seriously the idea that hylomorphism touches all aspects of Aristotle’s nature, then we will have no problem understanding the true relation between the heating of the heart and the experience of anger. The heating of the heart is simply the material side of the explanation in the same way the human body is
the material side of what it is to be a human being. Both anger and the human being are accumulative expressions of the material, formal, efficient, and final causes. Taking just the material and formal causes, I explained earlier how the material cause of human beings is the body while the formal cause was the soul. As formal cause, the soul is understood as an actuality of the body, just as the shape of a bronze statue is the actuality of the bronze constituting it. Neither form nor matter causes the other, a fact confirmable alone by the incoherence of trying to conceive of one without the other; rather they are both different aspects of the same thing. Just as the body and the soul are the respective material and formal components of a human being, the heat surrounding the heart and the desire for vengeance are the respective material and formal components of anger. Thus, it is as incorrect to say that the heating of the heart causes anger as it is to say that the body causes the soul. And this same hylomorphic reasoning applies to the eye as well. The eye—specifically the eye-jelly—does not in any functional sense cause sight. Rather the eye is the material medium that is actualized by acquiring the form of a perceived object. Sight itself, like anger, is explainable by reference to these two causes as well as efficient (the object perceived) and final causation (the act of seeing itself). Furthermore, to suggest that anger is in any sense caused by the heating of the heart or sight is caused by the eye is to privilege material causes over all the others—implying that material cause itself causes the others—when in fact we have seen that if any cause is to be privileged it is the formal cause, as it represents an actuality of a material potential. By disregarding the potentiality that matter embodies, the proposed view marks a return to Aristotle’s disagreement with Plato’s conception of material causation.  

I discussed earlier that

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28 See page 11
Plato’s *Timaeus* presents a theory of matter that is unacceptable to Aristotle because it treats matter not as a potentiality for change but as a thing unto itself. Aristotelian matter on the other hand is always enformed, incapable of independent existence.

In trying to reinterpret a single passage of *De Anima*, Goldberg effectively rewrites the rules of hylomorphism and introduces difficulties for Aristotelian causation. On his reading material causation quickly loses its hylomorphic identity and takes on an unacceptably Cartesian one. His second proposal changes course by backing away from such a strongly mechanistic interpretation. Instead, by stressing the notion of functional organization he purports to show that Aristotle endorses conditions *a* and *b* itemized above: ACP and FNSC. In response I argue that Aristotle’s view entails that certain material restrictions apply: human beings must be made of *human* material. With the rejection of ACP, the rejection of FNSC logically follows. But first to Goldberg’s second proposed interpretation.

To avoid the anti-functionalist tone of “matter of such and such a kind” Goldberg additionally suggests that the phrase might refer to functional organization. “Anger,” he claims, “need not essentially be ‘in’ the actual material of a human being; rather the *kind* of matter in which anger must exist would be a kind *with functional units*, like a heart” (51). His interpretation represents a textbook case of computational functionalism. What Aristotle means by matter of such and such a kind, he explains, is that the matter of the heart must be organized in such a way as to realize the pumping of blood. Beyond this, no further conditions are required in order to be a heart. Furthermore, since the kind of matter has no relevance to the *functioning* of the organ it consequently has no relevance to its *being*—i.e., formal nature. ACP and FNSC are hard at work.
The first thing to note about this second reading is that it is intended as a direct formulation of FNSC. However, it only succeeds in proving that the capacity to function is a necessary condition; it says nothing about it also being a sufficient condition. Take once again Aristotle’s example of the eye. If an eye lacks the capacity to function—perhaps because it lacks the requisite functional units—and is therefore only homonymously an eye, it does not follow that anything that produces the capacity to see—because it possesses the requisite functional units—is definable as an eye. The most we can conclude is what is already a widely agreed upon point among interpreters: functionality is necessary for an entity’s definition; it remains an open question whether or not it is also sufficient. Aristotle’s description of the eye and homonymy alone cannot justify FNSC, and therefore the inferential gap from textual evidence to ACP remains unbridged.

The second point I wish to make, which will extend into the remainder of my paper, is designed to foreclose the possibility of ultimately bridging this gap. Goldberg’s insistence on functional organization forms the basis of his strategy for resolving further textual difficulties. His aim, as noted earlier, is to show that after all the inessential qualities that have been unduly ascribed to functionalism are stripped away, what is left is a doctrine consistent, if not identical, with Aristotle’s biology. Both functional organization and an emphasis on functionalism’s core doctrine are brought together to dispel a passage that, because it threatens to undermine ACP, threatens to undermine Goldberg’s overall thesis. The passage occurs in the *Metaphysics* and brings out the anachronism most responsible for disfiguring Aristotle’s concept of matter and actuality.
Thus it provides a handy frame of reference from which to judge where Goldberg goes wrong.

In book Z11 of his *Metaphysics* Aristotle investigates the question, which parts of an individual belong to its form—and thus its definition—and which parts to the concrete thing? When considering the form of a circle the answer is made obvious by the fact that circles regularly exist in different material. The material out of which circular objects are made, then, cannot be part of the objects’ form. But what about forms that are only ever found in one kind of material, such as the form of man? As Aristotle observes, “The form of man is always found in flesh and bones and parts of this kind.” Given this, it may seem that the material parts composing man would, unlike those composing circles, belong also to the form of man. However, Aristotle rejects this conclusion by plainly asserting, “No, [the parts] are matter.”

What is most troubling for defenders of functionalist interpretations is Aristotle’s observation that, like man, “some things surely are a particular form in a particular matter, or particular things in a particular state” (1036b3-23). If the form of man is realizable solely in the material of flesh and bone, then ACP is evidently violated. As a result it becomes unclear in what sense Aristotle is a functionalist. One way of responding is to suggest that since matter is not part of a thing’s form, there is nothing in principle that prevents the form of man being realized in another kind of matter. That some things are a particular form in a particular matter would then be a fact of contingency, yet admittedly less apparent than in the case of a circle.29

Another way of responding is to take Goldberg’s approach and grant that ACP may be violated, but in a way consistent with functionalism’s main principles. He explains that

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29 Shields takes this line in his article *The First Functionalist* (p. 23).
even modern functionalists are forced to abandon ACP when confronted with overly complex functional systems. Citing Daniel Dennett, a well-known functionalist, Goldberg affirms, ‘It is empirically unlikely that the right sorts of programs [or rules for functional organization] can be run on anything but organic, human brains’ (49). On this picture ACP may justifiably be violated because functionality remains the number one concern; the kind of matter instantiating a functional system may be of relevance only to the extent that it contributes to functionality—this I term restricted compositional plasticity (RCP). Goldberg thus concludes that the complete disregard of matter, a feature long associated with the essence of functionalism, gives way under certain circumstances. More importantly for Goldberg, the gulf between Aristotle and functionalism appears to narrow.

There are a number of questions that immediately come to the fore in light of Goldberg’s move here. How exactly can Dennett, who promotes a decidedly uncommon functionalism, represent a view that is also essential to the theory? Does he mean to distinguish a practical functionalism from a theoretical one? Has functionalism lost all meaning with such a fettered compositional plasticity? While these and related questions themselves merit thorough analysis, I plan to concentrate my focus not on Dennett’s view per se, but its application in Goldberg’s work. It is correct to claim that in order to realize the form—and thereby the function—of a human being the matter must be capable of sustaining that form. The problem is that Goldberg conceives of form in terms of structure alone, whereas Aristotle sees much more than mere structure in a thing’s form. According to Aristotle, form is actuality, a metaphysical concept incapable of adequately

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30 In footnote 2 Goldberg writes, “On my read of Aristotle, a substance is matter in a particular form—where a form might be understood as structure or organization.”
being captured by suggestions of structure. As a result half of the story of actuality, and thus of what it means to be of human form, remains untold. In the next section I will briefly review the major points of Aristotle’s concept of actuality in connection with the material conditions necessary for realizing the human form. What emerges is a picture of matter fundamentally at odds with both ACP and RCP.

Aristotle and Actuality

Earlier I noted that Aristotle defines the soul as an “actuality of the first kind of a natural body having life potentially in it.”\(^{31}\) The actuality spoken of here refers to form and potentiality to matter. As stated, the soul as an actuality of the material body is the form of a living thing. Goldberg is quick to point out that the material body must be of a suitable \textit{structure} to bring about this actuality. However, actuality may be said to correspond to structure only at the highest level of hylomorphic analysis. When analysis extends below this level, the more accurate depiction of actuality as corresponding to something like ‘activity’ or ‘being in a more complete state’ becomes more apparent, and talk of structure misplaced.\(^{32}\) Actuality is a metaphysically-laden concept permeating every layer of an object’s being. To better grasp its metaphysical underpinnings, as well as its relation to potentiality in the context of Aristotle’s theory of hylomorphic compounds, it is useful to consider actuality from an epistemic angle.

\(^{31}\) In this section I restrict discussion of actuality to the sublunary realm of objects.

\(^{32}\) Aristotle introduces actuality by way of analogy, describing it as being like “that which is seeing to that which has its eyes shut but has sight, and that which has been shaped out of the matter to the matter, and that which has been wrought up to the unwrought. Let actuality be defined by one member of this antithesis, and the potential by the other” (\textit{Meta} ix 6, 1048b1-4). Notably, since Aristotle himself coined the both senses of actuality, \textit{energeia} and \textit{entelecheia}, interpreters are tasked with determining appropriate translations for them. All proposed translations center on the concept of being in a more complete state.
As I’ve already covered, Aristotle’s theory of scientific explanation deals exclusively with natural phenomena that occur always or for the most part. The causes associated with these phenomena are intrinsic because they are determinate and derive their explanatory power from the forms of objects. In the *Metaphysics* Aristotle says, “There is knowledge of each thing only when we know its essence,” and later identifies essence with form (1031b6-7).\(^3\) Accidental causation on the other hand cannot inform Aristotle’s science because it does not operate regularly in nature: “…that there is no science of the accidental is obvious; for all science is either of that which is always or of that which is for the most part.” Further, the reason accidental causation does not occur regularly is because it belongs to the domain of matter and potentiality, not form and actuality: “The matter, therefore, which is capable of being otherwise than as it usually is, must be the cause of the accidental” (1027a13-21). And, contrary to the link Aristotle draws between form and knowledge, he says that “matter is unknowable in itself” (1036a8-9). Therefore, to the extent that a thing lacks form it will not be knowable.

Now this raises interesting questions for Aristotle’s metaphysics. A human being, for example, is knowable as such because it possesses a soul—i.e., the form of a living human. And when a human dies we are left with a corpse, something only homonymously human. We certainly know these things to be corpses, but the question is, how *can* we if they have lost their form? The answer has to do with Aristotle’s statement in the *Physics* that “matter is a relative thing—for different forms there is different matter” (194b9).

What counts as matter (potentiality) is relative to the form (actuality) under consideration. Hence, the reason we can know a thing to be a corpse is because it never completely lost

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\(^3\) “By form I mean the essence of each thing, and its primary substance” (1032b1).
its form to begin with—for if it did then it would be nothing more than potentiality and thus fail to be a thing at all. Rather, it merely lost it in a single respect. That is to say, it lost only the form of a living human. As a corpse it nevertheless has the form of whatever shape characterizes it.

So the objects of knowledge in both cases would be the soul and shape respectively, but the matter for a living human would be quite different from the matter for a corpse. In the former case the matter is the whole body. In the latter, however, it is the mixture of elements that composes the body—a specified ratio of earth, water, air, and fire. The reason for this difference has to do with the level at which we analyze each thing. The highest analyzable level of a living human is the level at which its body is the matter and its soul the form. The highest analyzable level of a corpse is the level at which the ratio of elements is the matter and the shape of the body is the form. In either case the analysis can be pushed even further until we reach the level of the individual elements themselves. At that stage the form of each element can be resolved into its component properties—cold and dry for earth, cold and wet for water, hot and wet for air, and hot and dry for fire—which are predicated of a “prime matter” underlying each elemental body.

The main point I wish to underline is that because matter is a relative term, and thus form as well, it follows that at every level of a thing’s being there is a potential way for it to be as well as an actual way for it to be. While there may be a highest level of hylomorphic analysis, or a ‘completed state’ in which a thing may come to be—e.g., a rational thinker in the case of humans—there is no absolute form actualized in an absolute matter. Instead, the matter at any one stage can itself be analyzed as a compound of matter.

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34 Note that, properly speaking, Aristotle would not describe a corpse as a body at all.
35 Although the existence and/or nature of “prime matter” is a point of great debate among scholars.
and form. Matter, in other words, is itself enformed, and indeed must be if it is to be identifiable (or knowable) as anything at all. For living things this means that they have soul, an actuality defined specifically as *energeia* (activity). This *energeia* is what gives organisms the capacity to engage in the activities characteristic of their kind. And this capacity, again, is first actuality. Second actuality (also *energeia*) refers not to a capacity but to the actual *doing* of an activity characteristic of an organisms’s life-function. Importantly, although both kinds of *energeia* have the world “actuality” in them, they nevertheless represent a potentiality-actuality relation. Thus, for an organism to be actually, say, perceiving it must first be capable of perceiving. While this appears to be little more than a trivial point, it speaks to how explanations of *energeia* bottom out in the concept of potentiality. As an illustration, consider again the differences between a living human and a corpse. Although both are structurally identical, Aristotle maintains that the corpse is only human in name because it does not have life potentially within it. I will say more about this later. At present it is enough to stress the multiple layers at which potentiality-actuality relations can be analyzed and the operation of *energeia* in living beings.

In talking about a material’s underlying layers of actuality we must take care to treat the analysis non-reductively. For simplicity, let's return to the example of a bronze statue. In *Metaphysics IX* Aristotle explains that just as earth is not the potentiality of a statue, the seed of man is likewise not the potentiality of man.\(^{36}\) Instead, earth is the

\(^{36}\) “The seed is not yet potentially a man; for it must be deposited in something other than itself and undergo a change. But when through its own motive principle it has already got such and such attributes, in this state it is already potentially a man; while in the former state it needs another motive principle, just as earth is not yet potentially a statue (for it must first change in order to become [bronze])” (1049a15-19).
potentiality of the bronze out of which the statue is made, and the bronze in turn is the potentiality of the statue. A reduction that moves from one level to a more fundamental level is unacceptable. But Aristotle goes further, urging that this remains so even at a single level of analysis. Aristotle says of a casket that it “is not ‘wood’ but ‘wooden’, and wood is not ‘earth’ but ‘earthen’” (1049a23). Similarly, we cannot conclude that a statue is bronze or that man is flesh and bones. This would be to reduce the actuality of something to its potentiality, an error I earlier attributed to Goldberg’s understanding of the relation that anger bears to the heart. The formal side of anger, recall, is the desire for revenge. The material side is the heat surrounding the heart. Desire for revenge is not reducible to material processes involving a heated heart. Both the formal and material accounts are ineliminable and irreducible aspects of the same phenomenon. The heated heart is to the wood of the casket as the desire for revenge is to the casket form, and both anger and the casket, as whole entities, are the objects of explanation.

One can only marvel at how sharply Aristotle’s ontology and methods of explanation differ from those of the modern functionalist. It is their incompatible theories of matter that is most responsible for driving apart their philosophies. On the one hand is hylomorphic matter, which, since it implies the impossibility of pure matter (potentiality), is always enformed (actualized). On the other is a Cartesian matter that, like any contemporary account of substance, is unfit for the applications of actuality and potentiality. Thus it is apparent why Goldberg never quite lets go of structural actuality: he is at pains to highlight the few identifiable similarities between Aristotle and the functionalist. Indeed in his work structural actuality seems to crowd out *energeia* altogether, a concept that has far more to teach about the hylomorphic grounds in which
Aristotle’s methods and metaphysics take root. Exploring the depth of the disconnect between the Aristotelian and functionalist paradigms is arguably sufficient for upending the whole of Goldberg’s claims, but there is a final worry that a generous reading of his position enjoins us to first consider. Given his general strategy one suspects that condition \( c \), Cartesian matter as a necessary condition for functionalism, is yet another that Goldberg denies; that Cartesian matter, like ACP, has been misconstrued by philosophers as a characteristic definitive of functionalism. Am I myself the latest victim of this misconstrual?

In truth, to give up on this condition seems to me to give up on the essential meaning of functionalism. A theory of matter that is not definable in terms of the arrangements of its parts, the causal relations they have with one another, and the computational states that characterize them cannot properly belong to functionalism. The theory’s main appeal has been in its treatment of the problem of reductionism, a direct outcome of regarding micro-level units of matter as the fundamentally “real.” This problem never arises, nor can ever arise, for Aristotle. But while it seems deeply implausible that Goldberg would reject condition \( c \), the force of my argument does not hinge on its rejection. Rather, I set my sights on FNSC. Specifically, I take aim at the irreconcilable ways that RCP bears on the functionality of an entity for Aristotle as compared with the functionalist. Even if it is granted that Dennett is correct to claim that a human brain may be the only kind of matter capable of achieving certain functional states, he would be correct for reasons entirely different from those Goldberg ascribes to Aristotle’s suggestion that the human form is only ever found in a body of flesh and bones. To say that both are bound by material restrictions is to stop short of a full
explanation that reveals conclusively why aristotle cannot be a functionalist. This explanation involves Aristotle’s theory of biological generation and is the object of the next section as well as the final point towards which my general argument has been developing.

Aristotle and the Human Form

In his *Metaphysics* Aristotle describes how actuality is temporally prior to potentiality. He writes, “From the potentially existing the actually existing is always produced by an actually existing thing, e.g. man from man, musician by musician; there is always a first mover, and the mover already exists actually” (1049b23-26). With the suggestion that man is produced by man, it is clear that he takes biological generation to be paradigmatic of actuality’s temporal priority. He explains that the first mover must already exist in actuality and possess the form that is to be transferred to that which is capable of possessing that form. So just as it is “that which is hot that produces heat,” Aristotle says, “in general that which produces the form possess it” (*Physics* viii 5, 257b9-10). Furthermore, just as an eye must consist of a material suitable for accepting the form of a perceived object—i.e., it is “potentially like what the perceived object is actually”—so the matter of that which will become a human must be “potentially such as that from which it came”—namely, a prior human (*GA* iii 11, 762b2-3). Predictably, the form referenced here is that of the human. It is imparted by the male semen to what Aristotle calls the *katamênia*, the matter in the female that will come to be the embryo. Thus, the male acts as the efficient cause supplying the human form and the female acts
as the material cause supplying the matter that accepts the form. What is laid out is a straightforwardly hylomorphic set of processes.

Now throughout this investigation into the nature of Aristotelian actuality I have swerved repeatedly into territory that can only be deeply unfamiliar, if not unfriendly, to functionalism. And while at several junctures along the way the prospect for reading Aristotle as a functionalist has dimmed considerably, I have done my best to consider Goldberg’s claims as generously as possible. So if this prospect should not be extinguished completely, the reasons for thinking so will have been given fair hearing. That said, there remains one further fact concerning Aristotle’s biology that overrides any restraint one can possibly exercise in the practice of charitable interpretation.

When I spoke earlier about first and second actuality I said that the former may be seen as a potentiality of the latter, such that a living thing can engage in the activities specific to its kind only when it first has the capacity—owing to the presence of soul—to do so. I also cited Aristotle’s assertion that the seed of man is not the potentiality of man; an intervening change must mediate the greater change from seed to man. The same kind of intervening change applies no less to the katamênia. Putting these ideas together brings forth the notion of first potentiality, the potentiality preceding first actuality. The seed of man and the katamênia can both be seen as the potentialities of a potentiality for second actuality in the same way. The analogy between them can be illustrated as follows:

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37 “For, as we said above, the male and female principles may be put down first and foremost as origins of generation, the former as containing the efficient cause of generation, the latter the material of it” (GA i 2, 716a5-7); “Let us return to the material of the semen, in and with which is emitted the principle of soul” (ii 3, 737a6-7).
The important point here is that in order for the *katamênia* to accept a soul and acquire its corresponding capacities, it must first have the requisite potentiality to be ensouled. This is precisely why, as previously noted, Aristotle does not think a corpse has life potentially within it. Corpses lack first potentiality.

But what exactly are the preconditions for ensoulment that first potentiality embodies? Beyond the facts related to the involvement of a mother and father, Aristotle articulates a further preconditon: “Now it is true that the faculty of all kinds of soul seems to have a connexion with a matter different from and more divine than the so-called elements; but as one soul differs from another in honour and dishonour, so differs also the nature of the corresponding matter” (*GA* ii 3, 736b29-32). The matter to be ensouled is unique to that kind of soul. Therefore human generation requires human matter. So essential is the connection between soul and matter that a being made of different matter that could nevertheless perform all the functions of a human would still not qualify as a human on Aristotle’s view. In addition to the proper functioning the being would require human matter. At last, FNSC, the only condition I’ve stipulated that must obtain, has been violated.

An objection immediately surfaces. Might it be that RCP in Goldberg’s revised functionalism was meant to refer not only to structural actuality as I have framed it, but also actuality as *energeia*? So when Aristotle asserts, “The form of man is always found in flesh and bones and parts of this kind,” Goldberg would understand this as an appeal
not to the structure that flesh and bone give rise to, but their *energeia as human* flesh and bone, distinct from those belonging to any other species.

However, I don’t find this at all likely. Apart from admitting that he interprets ‘form’ to mean structure or organization (see footnote 26 above), there is the additional fact that such a move would make nonsense of the parallel he draws with Dennett’s position. When Dennett says, “It is empirically unlikely that the right sorts of programs [or rules for functional organization] can be run on anything but organic, human brains,” he cannot possibly be appealing to something like *energeia*. There is nothing about being a *human* brain in terms of *energeia* that produces the complexity we observe in its functional organization. Admitting that there is would be strange from the perspective of contemporary cognitive science. More crucially, it would be a markedly anti-functionalist position to take. What he intends to say is more accurately captured in the frame of a theoretical/practical distinction. Dennett observes not just that the scenario in question is unlikely, but *empirically* unlikely. What this suggests then is that he is taking a cognitive inventory of the biological world and ascertaining the improbability (not impossibility, notably) of finding a nonhuman brain capable of a human brain’s functional complexity. This is not a theoretical claim. It does not preclude the theoretical possibility of finding or creating such complexity in another kind of brain or functional system. At most Dennett is gesturing towards the practical improbability of simulating the functional organization of the human brain.
CONCLUSION

The main purpose of my paper was to explore the far-reaching implications of Aristotle’s theory of hylomorphism and how their careful consideration should safeguard against anachronistic interpretations of Aristotle’s science. One such kind of interpretation relates to how we understand Aristotle’s philosophical motivations. This was addressed in the first part of my paper, wherein I argued against Goldberg’s thesis that Aristotle’s philosophy of mind arose out of an intention to replace Platonic dualism. The temptation to draw a parallel here with the motivations of modern functionalism is powerful but ultimately without its merits. For I argue that when we take a step back and examine Aristotle’s grievances with Plato’s philosophy, concerns about the mind are completely absent. What Aristotle is concerned to show is that Plato’s causal account and theory of knowledge are deeply misguided and stand in need of correction. Aristotle’s hylomorphism is at bottom an effort to devise a satisfactory causal account and in so doing a firm basis for scientific knowledge. His philosophy of mind, conceived as a rational capacity of soul, is simply an outcome of this effort.

Another kind of anachronism that I argued is perpetrated by Goldberg has to do not with Aristotle’s motivations per se, but with the specific content of his philosophy. In part II of my paper I challenged his functionalist interpretations of key passages of De Anima on logical as well as textual grounds. That an eye is only hononymously an eye if it no longer functions only proves that functionality is a necessary condition, not a sufficient one as well. Also, Goldberg’s proposal that the heart causes anger when it is heated carries implications that cannot be squared with Aristotle’s theory of scientific knowledge, specifically as it relates to intrinsic causation. Lastly, I took up his strategy
for getting around the difficulties posed for his view by the passage in the *Metaphysics* that describes the form of man being found in one type of body. What I have attempted to show is that Goldberg’s notion of *restricted compositional plasticity* only applies to the structure of bodies and their parts. Since Aristotle’s use of actuality refers to structure in addition to material, Goldberg’s proposal misses out on a defining area of Aristotle’s hylomorphic thinking. Not only this, it cannot be made compatible with it either. It is clear that on his theory of generation Aristotle believes the matter—conceived of *not* in terms of structure—originating in the female must be potentially human in order to *actually* be human. Thus, the condition of FNSC is violated and the functionalist interpretation cannot be upheld.
BIBLIOGRAPHY


