Aristotle and Contemporary Theories of Mind

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I. Introduction

In recent years, Aristotle's views on sensation and mental activities have received increased interest from philosophers for their apparent similarities to contemporary theories in the philosophy of mind. Instead of seeking to explain mental states (feelings, beliefs, desires) as mere properties of the material constitution of an organism (i.e., brains and nervous system of higher animals), the most popular theories in the philosophy of mind focus on the function which mental states perform in life of an organism, and the organization of the matter which allows the mental states to play this functional role. Theorists have seen in this focus on function and organization an affinity to the central place Aristotle gives to form over matter, and to his defining capacities in terms of their functional realization. While certainly similarities exist between contemporary theories of mind and Aristotle's philosophical views on perception and mind, the description of the nature of mental states which contemporary theories give us is fundamentally at odds with Aristotle's understanding of them. This is most clearly seen in the case of sensation, since Aristotle has most to say about it. Despite the difficulty in claiming that Aristotle's views fit the requirements of contemporary theories, his insights into the actual nature of mental activities and states are nevertheless valuable precisely for illuminating these limitations of current theories, and for suggesting ways of overcoming some difficulties.

In this presentation, I will briefly describe the theories for which Aristotle is thought to be relevant and their common, salient features and assumptions. Next, I will examine the details of some interpretations of Aristotle's thoughts on sensation which allegedly support the contemporary theories. In the course of this examination, I will indicate the fundamentally different view Aristotle has of the physical processes involved in sensation, and try to indicate how these differences might help overcome problems in the contemporary views.

II. Contemporary Theories of Mind

Functionalism

Arguably, the most widespread view in the philosophy of mind can be generally characterized as functionalism. In its most general form, functionalism is primarily a theory about the nature of the mind in competition with Cartesian dualism, on the one hand, and reductive materialism, on the other. Functionalists are adamant that their theory is not a reductionist account. Strict reductionism maintains that the mental can be reduced to, i.e. identified with, the material components of whatever has the mental state. Functionalists claim that there is no more to a creature which manifests mentality than its material constituents, but mentality cannot be identified with the physical properties of these creatures. Functionalists realize that mental states have an irreplaceable reference to other mental states and to non-mental physical states. Thus, pain might be described as that state that results from physical injury to an organism, is likely to produce avoidance behavior in that organism given other mental states, e.g. that it does not want to endure the pain for some reason more than it wants to avoid it, and it believes such behavior will lead to the cessation of the pain, etc. A pain-state may also cause other mental states, e.g. the desire for revenge, which may, in turn, lead to observable behavior.

The specific matter of which something is made does not alone explain why things have mental states, according to functionalism. Instead, it is the functional organization of an organism which accounts for its mental states. Mental states are defined by their relation to stimuli (inputs), other mental states, and behavior (outputs). Whatever instantiates internal states that have these relations would be a subject of mental states, and its internal states which had these relations would be, by definition, mental states. As Hilary Putnam informs us, "a given functional organization ... is capable of being 'built into' structures of many different logically possible physical (or even metaphysical) constitutions."[1]

Thus, it is seen as a great advance over reductive materialism that mental states, according to the functionalist description, be multiply realizable. That is, functionalism is believed to have greater explanatory power in that it claims that mental states can be realized in anything as long as the realization of the states have the defining relation to input, other states, and outputs.

Although the functionalist account of the mental states allows that they can, in theory, be realized in a variety of physical systems, such systems will still have certain similarities. Specifically, in order for any two systems to serve as a realization of the same mental states, they must be functionally isomorphic. Putnam explains what this means: "Two systems are functionally isomorphic if *there is a correspondence between the states of one and the states of the other that preserves functional relations.*"[2] That is, in order to have such states as defined by functionalism, its physical states must be related to each other in functionally specified ways; functional relations are the causal relations between stimuli, other mental states and behavior as specified by a theory. Such a theory is a precise description of how certain psychologically significant events and states cause and are caused by other psychologically significant events and states. An entity has mental states only on the condition that its internal states instantiate functional relations, that is, the causal relations which a psychological theory postulates to obtain between mental states.

Thus, functionalism claims that a given system has a mind if and only if there are certain unspecified properties of that system (call them "states")[3] such that whatever causal relations that a psychological theory specifies to obtain between the mental entities (having a pain, believing that p) also obtain between the states. Any system whose internal states bear to one another the same causal relations which the psychological theory specifies is subject to the same psychological description according to the theory. Such systems, then, are functionally isomorphic. If a human, a lion, a Martian or a computer acts, reacts and has internal states in a causal economy consistent with what a psychological theory postulates as being in pain, then the human, lion, Martian or computer ***is*** in pain.

It should be noted that a species of functionalism, called cognitivism, adds to the general theory the idea that mental behavior is explained in terms of varying levels of internal states. Cognitivism, then, understands mental states as computational states of information processing systems. Essentially, it portrays mental capacities as computational programs running on a physical system, for example, a human brain, a lion brain, whatever organs Martians might have, or a digital computer.

It is in their theory's stress on functional organization, however, that these sorts of materialists see an affinity with Aristotle, for they believe that this is what he means by form. Although in its ordinary use "form" connotes shape or configuration, Martha Nussbaum, for instance, claims that what Aristotle means by form is something very close to what functionalists mean by "functional organization."

> But in the case of living things, it is very clear that to explain behavior we must refer not to surface configuration, but to the functional organization that the individuals share with other members of their species. This is the form; this, and not the shape remains the same as long as the creature is the same creature. The lion may change its shape, get thin or fat, without ceasing to be the same lion; its form is not its shape, but its soul, the set of vital capacities, the functional organization, in virtue of which it lives and acts.[4]

Neither Aristotle nor the modern functionalist believes that a reduction to material constituents provides an adequate explanation of animal behavior. An adequate explanation, however, can be given, it is argued, in terms of form for Aristotle or in terms of functional organization for the functionalist. It is further argued that Aristotle's form is equivalent to functional organization in all relevant aspects.

An essential point of the functionalist position is that the same functional states can be realized in a number of material systems. S. Marc Cohen claims that Aristotle is sympathetic to this feature of functionalism wherein the same mental states are realizable in various ways. According to Cohen, in *De Partibus Animalium*, Aristotle's

> remarks strongly suggest a conviction that the same psychic state may have different material realizations. In animals made of flesh, for example, the organ of touch is flesh; in other animals it is the part 'analogous to flesh' (PA 2. 1, 647a21). Sensations of touch occur in the flesh of humans, but in different (though analogous) organs of other species. Such observations, which abound throughout the work, suggest a sympathy for the *compositional plasticity* that is characteristic of functionalism. (Cohen, p. 59.)

This again is the claim that mental states are multiply realizable – that they can be realized in a variety of ways – in organisms or systems which differ physically.

Supervenience

Since a functionalist or cognitivist description of mental states does not mention their introspectable, phenomenal character – what it is like to see red, for instance – these mental properties are sometimes declared to be irreducible to the physical properties of the organisms which have them. Mental properties are nevertheless said to depend on, and be totally determined by, the physical properties. Phenomenal mental properties are thus said to *supervene* on physical properties in the event that creatures in the same physical state have the same mental state. The motivation for this postulate is the fear that there might be a system or organism, which while functionally isomorphic to a normal human being (its internal states cause behavior and other states and are caused by stimuli and other states, just as a psychological theory specifies), nevertheless has no phenomenal features to its mental states; these hypothetical creatures are popularly (and in the professional literature) known as a zombie. Fear of zombies has led philosophers of mind to assert that the consciousness characteristic of mental states supervenes on the physical, albeit functional states, of animals, especially humans. Insofar as they are supervening, phenomenal properties will be the same when the things on which they supervene are the same. Thus, mental properties, like having a sharp pain, supervene on, i.e., are determined by but not reducible to, physical properties, like having certain neurons fire.

Steven Everson employs the notion of supervenience in interpreting Aristotle's doctrine of perception, claiming that, for Aristotle, perception as cognitive awareness supervenes on physical processes which take place in sense organs.[5] According to Everson, the mental state of being aware of a red object supervenes, in Aristotle's theory, on the physical alteration the eye undergoes in receiving the form of red without the object's matter. Awareness is not reducible to the physical alteration, but it is nevertheless determined by it. Aristotle thus appears to be relevant to contemporary discussions about the nature of mentality by being identified as an ancient precursor to a non-reductivist, yet thoroughly materialist, theory of mind.

III. Common Features of Materialists

The essential materialism of the functionalist position becomes apparent when they describe its hypothetically extension to non-physical (i.e. metaphysical) realizations. According to Putnam, functionalism insists "that, in principle, a machine (say one of Isaac Asimov's wonderful robots), a human being, a creature with silicon chemistry, and, if there be disembodied spirits, a disembodied spirit could all work much the same way when described at the relevant level of abstraction, and it is just wrong to think that the essence of our mind is our "hardware."[6] But what is necessary for a system to have a mind, according to the functionalist description, is that it be composed of parts such that the inter-relations of the parts constitute states of the system, and the parts in a given state cause other states. Even when functionalists claim that a non-physical (metaphysical or spiritual) system could instantiate a certain functional organization, they conceive of such non-physical systems as made of parts in a certain states or configurations which, in turn, cause other states to be realized. As Richard Boyd puts it:

> Indeed, there seems to be no barrier to the functionalist materialist's asserting that any particular actual world mental event, state, or process could be -- in some other possible world -- non-physically realized. All one need do is invoke a possible world in which the systematic replacement of parts of the central nervous system involves their replacement by non-physical causal factors with the capacity to influence the other parts of the central nervous system in a way that exactly simulates the function of the replaced part (which we can imagine becomes deactivated).[7]

Thus, the causal role that a given state plays within an overall functional organization is understood to be due to the causal capacity of the parts (physical or metaphysical) of which a system is composed. Other matter (or bits of spirit) in the proper configuration and with the same causal properties may play the same causal role that, for example, the gray matter in a human brain plays. Ned Block, in his essay "What is Functionalism?," summarizes the point well:

> (A)s functional state identity theorists have often pointed out; a *non*physical state

> could conceivably have a causal role typical of mental state. In functional specification terms, there might be a creature in which pain is a functionally specified *soul* state.[8]

However, the states of whatever system that have the theoretically specified causal roles do so because of the properties belonging to that system's constituents. Thus, in order to have a functional organization, it seems clear that something has to be made of parts. Moreover, the configuration of these parts is what play their functional role precisely insofar as the configurations (or functional states) have the causal role the psychological theory specifies; functional states are thus physically caused by and cause other states. The manner in such functionalists understand how a system is in the functional state it is in, and how these states are causally inter-related, show that they understand the systems in fundamentally materialist terms. For, the configurations come to be and pass away as the system as a whole is altered and affected, and these are essentially materially changes of state.

IV. Physical Process in Sensation

For any interpreter of Aristotle's philosophy of mental states, it seems undeniable that he thinks perception necessarily has a physical aspect. Steven Everson (who argues for supervenience in Aristotle's theory), for instance, points to what Aristotle has to say about the physical requirements for something to serve as a sense organ, as well as to the breakdowns in the perceptual process which result from this, perceptual blind spots and the impediment to perception posed by intense perceptibles. Because Aristotle specifies in some detail the physical constitution that sense organs must have in order to function properly, and that perceptual failures result from damage to sense organs, Everson and others (not surprisingly) suppose that there must be some processes occurring in sense organ. It is tempting to believe that the physical processes which the sense organs undergo are standardly material changes, what Aristotle calls an 'alteration' (αλλοιωσις) in *On Generation and Corruption*.

In *DA* 2.5, Aristotle distinguishes two kinds of alteration and seeks to specify the manner in which each is applicable to perception. He begins by saying that "sensation consists, as has

been said, in being moved and acted upon; for it is held to be a sort of change of state" (416b34-35). Yet, he soon makes a core distinction: Even the term 'being acted upon' is not used in a single sense, but sometimes it means a kind of destruction of something by its contrary, and sometimes rather a preservation of that which is potential by something actual which is like it, as potency is related to actuality. For when the one merely possessing knowledge comes to exercise it, he is not being altered (for the development is into his real self or actuality), or else is a different kind of alteration. (417b2-8). He concludes by saying that "there are two senses of alteration, one a change to a negative condition, and the other a change to a positive state, that is, a realization of its nature" (417b15-17).

Everson labels these two senses of alteration "alteration$_1$" and "alteration$_2$" and explains the basic distinction between them: "When something undergoes alteration$_1$, it loses the property it had before the alteration and acquires a 'contrary' property; in alteration$_2$, it simply exercises a capacity it already possesses." (92) Although he does not elaborate on the correspondence, Everson does acknowledge that this distinction between two sorts of alteration corresponds to Aristotle's distinction between motion (κινησις) and activity (ενεργεια) in *Metaphysics* 9. 6 and *Nicomachean Ethics* 10. 4. (95 and 225) While alteration$_1$ is clearly a physical process, alteration$_2$, in being distinct, might seem to be nonphysical. Aristotle identifies the act of perception with alteration$_2$ for he says, "Again, actual sensation corresponds to the exercise of knowledge . . ." (417b19) as the exercise of knowledge comes about through an alteration$_2$ (417b7-8), so does actual perception. In *Meta*, he also identifies seeing with activity (1048b18-34).

Everson believes this chapter shows that both kinds of alteration are involved in perception, (93-94) and appeals to *Physics* VII. 2 for support. There, Aristotle asserts that in perception there are two sorts of alteration, one of which both the animate and the inanimate are susceptible to, and another of which only the animate, that is the sensate, is capable (244b9-15). (136) According to his account, the material change (alteration$_1$) determines the psychological activity (alteration$_2$), and that this is necessarily implied in *Physics* VII. 3 (246a4-9).[9] When a man or a house comes to be, the man or house is not altered since it only has just come to exist;

its coming to be, however, may have been necessitated by matter undergoing alteration$_1$. As Everson says, "If this is right, then Aristotle commits himself here to the determination of changes at the formal level by alterations at the material level...." (271) Furthermore, to the extent that material changes determine formal changes (261), this interpretation claims that alterations$_2$ supervene on alterations$_1$; the psychological process supervenes on the material change.

Believing that both kinds of alterations are involved in perception and that alterations$_2$ supervene on alterations$_1$ creates severe difficulties as an interpretation of Aristotle. First, Everson claims that the change in the organ is not strictly perception. Rather, the subject perceives by becoming aware of the alteration taking place in the sense organ. (137) It is a curious element of Everson's interpretation of Aristotle, then, that one is not aware of a sensible quality as it belongs to an external object, but only as that quality is in the organ.

> On Aristotle's account . . . the red of which one is aware when one perceives something is not some mental item, or property thereof, but the modification of something straightforwardly material. What one is aware of *is* the redness of the object which affects the eye, since that is the colour which the eye has taken on when affected by it and one is aware of the affection of the eye. (138)

One is directly aware of a bodily affection, i.e., of the αισθημα, and by means of this awareness, one perceives the external object. Everson believes this view is confirmed by how Aristotle distinguishes between the activities of imagination and perception. Citing *On Dreams*, Everson says: "So at 460b2-3 we are told that 'even when the external sense-object has gone, the *aisthemata* [that is, the perceptual affections], which are objects of perception, remain." (175) This reading of the text is not insignificant, however, since Everson uses it to show that in both imagination and perception one is aware of bodily affections, and that the difference between them for Aristotle is their causal history. He reiterates the point a few pages later when he says: "We have already seen that in the [*On Dreams*]., Aristotle takes the *aisthemata* [perceptual affections] themselves to be *aistheta*, objects of perception (460b2-3)." (177) He then summarizes what he takes to be Aristotle's view of the perceptual process: "The external object acts on the sense organ so as to produce an *aisthema*, which is then transmitted to the central

organ. The subject perceives the external object because he is aware of that *aisthema*." Everson elucidates in a note:

> Wedin (1988), 37, comments that 'Ordinarily' *I* am not aware of the perceptual state, or *aisthema*, but only of the truck.' This, however, confuses what it is to be an object of awareness with what it is to be an object of perception. Ordinarily I will perceive the truck but will do so in virtue of being aware of the *aisthema* [perceptual affection]. What is represented as being in front of me is the truck and that is indeed what I have beliefs about if I assent to the perception. This is quite consistent with the fact that it is the *aisthema* which is the object of awareness. (Ibid., p. 87.)

Everson apparently believes that the representational features of affections are such that when one is aware of the affection, one perceives the object which gave rise to that affection.

That his view of Aristotle's theory of perception results in what is essentially an indirect realist theory of sense knowledge is at least an indication that Everson is misreading things. This theory, as thus presented, opens up some epistemological space for perceivers to fail in attaining their objects should the affection not resemble whatever causes it. Indeed, Everson believes that Aristotle holds to this theory just in order to account for such perceptual failures. But Aristotle also clearly believes that one directly perceives the proper objects of sensation (the redness <u>of the truck</u> – not the red affection in the eye caused by the truck). The only evidence offered for the indirectness of perception, i.e., *On Dreams* 2, 460b2-3, is far from conclusive in its support for Everson's interpretation. The passage reads: "even when the external object of perception has departed, the impressions it has made persist, and are themselves objects of perception." It seems clear that for Aristotle the affections to the organs, αισθηματα, become objects of perception *only when* the external object departs, for the examples from which Aristotle concludes to this general principle are all cases where an affection of the eye only becomes visible after one's vision has shifted from the object which causes it, such as the sun or a flowing river (459b8-23). It seems totally gratuitous, then, for Everson to offer a reading of this line wherein αισθηματα, are *normally* objects of perception.

V. Philosophical Objections to Supervenience.

There are even more compelling reasons against believing that Aristotle could accept that perceptual activity supervenes on physical alteration. For, the potency which the subject of a material alteration has at the beginning of the process is completely actualized by the end, and at the end it is no longer in a state of potency with respect to the same sort of alteration$_1$. What is materially altered$_1$ is in potency to what it will become, but in so altering$_1$, it thereby loses that potency to be altered$_1$. That is, once it is altered$_1$, it cannot then be altered$_1$ again with respect to the same quality. This is the definition of alteration$_1$. If, however, sense organs were to be altered$_1$ in perception, they would then lose their capacity to be altered again. Such a view of the physical process occurring in sense organs creates insuperable problems when it is connected to perception as an activity.[10]

If the alteration in question is becoming literally like its object, as it is for Everson, then the eye, for instance, is made literally red in one instant, and in just one part of its eye-jelly. That part, in that instant, then loses the potency to be affected by red until the affection that is there fades. However, one would expect that, in the next instant, even before the red affection fades, it could be affected by a blue object, turning the formerly red bit of eye-jelly blue. This should hold true because the eye-jelly, even though affected by the red object, is still matter for a living, functioning eye; thus, it should still have the capacity for sight. If it were true that red-ly affected eye-jelly bits can become blue, then one has abandoned Aristotle's principle that the eye-jelly be transparent in order to be affected by colors (*De Sensu* 2, 438a12-14). Clearly, then, this alternative is unacceptable.

However, if one denies that the red eye-jelly bit can become blue, on the other hand, and instead claims that the redness of the bit of eye-jelly must fade first, one still encounters problems. Such an account seems contrary to Aristotle's (and Everson's) commitment that perceptual awareness is a continuous activity. For, while looking at the same red wall, one does not ever cease to perceive it. If seeing occurs when the eye-jelly takes on the color of the object seen, however, one would not see the red wall for as long as it took the last moment's affection in the eye-jelly to fade. Perhaps, one could claim that eye-jelly affections fade rather quickly. In

this case, while it is true that until the previous affection fades there would be no perceiving, perception would occur intermittently, producing a sort of strobing effect which might go undetected. However, insofar as perception at least involves an activity, it is continuous, and our ability to engage in it is constant, even while already being engaged in it. Thus, the formal cause of perception could not be a single activity if it has to supervene on the strobing of alterations in the organs, since it is at least necessary that what supervenes be simultaneous with what it supervenes on. Supervenience, then, cannot accommodate both standard alterations and activities in an Aristotelian explanation of perception.

VI. Receiving Form without Matter.

The alternative to Everson and the supervenience of perceptual activity on material alterations finds its best support in *DA* 2.12. In this chapter, Aristotle gives a general summary of his views on sensation and entertains some problems associated with it. It is here that he claims that all perception is a reception of form without matter, and employs the analogy of a gold signet ring impressing a block of wax, both of which seem to provide problems for considering sensation as resulting from material alterations.

> We must understand as true generally of every sense that sense is that which is receptive of sensible forms without matter, just as the wax receives the impression of the signet-ring without the iron or the gold, and receives the impression of the gold or bronze, but not as gold or bronze; so in every case sense is affected by that which has color, or flavor, or sound, but by it, not *qua* having a particular identity, but *qua* being such, and in virtue of its form (*DA* 2.12, 424a17-24).

Here, Aristotle says that the sense receives form without matter, as the wax receives the impression without the iron or gold, but does not do so as gold or bronze.

The proper interpretation of the idea of the reception of form without matter has been quite controversial with respect to those who see perception as involving ordinary material alterations. Richard Sorabji claims that the phrase refers exclusively to the organ altering to becoming literally like its object. Thus, he claims that the point of the analogy with the wax

block and signet-ring in *DA* 2.12 is that the gold, i.e., the matter of what makes the impression, is what is left behind. All that is received is the impression, but this impression is a literal and physical impression in the wax. Likewise, the sense organ receives the sensible form of its object, i.e., comes to have literally in itself that sensible form.

> But there is good reason to interpret the reception of form without matter physiologically. It means that, for instance, the organ of sight . . . takes on the colour of the object seen, without taking on any material particles from the object, such as Empedocles and Democritus had postulated.[11]

St. Thomas Aquinas predictably has a different account of what Aristotle means by the reception of form without matter. In his *Commentary on the De Anima*, he entertains the objection that receiving form without matter does not seem to be unique to sensation since in non-perceptual cases of a thing being affected, the patient also receives the form of the agent without its matter.[12] St. Thomas explains that although in an ordinary case of being passively affected a thing does receive the form without the *agent's* matter, the patient still receives form *with* matter, i.e., within its own matter, since the recipient's matter "becomes, in a way, the same as the material agent, inasmuch as it acquires a material disposition like that which was in the agent." (n. 552.) He argues, then, that the reception of form without matter is in contrast to the patient taking on the quality in the same sense, i.e., in a material sense, as the agent.

> Sometimes, however, the recipient receives the form into a mode of existence other than that which the form has in the agent; when, that is, the recipient's material disposition to receive form does not resemble the material disposition in the agent. In these cases, the form is taken into the recipient "without matter," the recipient being assimilated to the agent in respect of form and not in respect of matter. And it is thus that a sense receives form without matter, the form having, in the sense, a different mode of being from that which it has in the object sensed. In the latter it has a material mode of being, but in the sense, a cognitional and spiritual mode. (n. 553.)

When the form is in the patient in a way other than as that form is in the agent's material

disposition, then the patient is assimilated in a way that is not standardly material. The fact that this second way differs from the first, i.e., material, mode, is what warrants calling it "without matter." In this second mode, however, it is still the recipient's material disposition which does not resemble the agent's; thus, the fact that he calls the manner in which form is in the sense a "spiritual" mode should not distract from the fact that even St. Thomas believes that this takes place in the organ: "the organ of sense is that in which a power of this sort resides, namely a capacity to receive forms without matter." (n. 555.) The reception of form without matter, then, is a physical process for St. Thomas to the extent that it takes place in the physical organ. He believes, then, that the second mode of receptivity, i.e., coming to have the quality but not according to the agent's disposition, is what Aristotle means to convey by the wax block example.

The force of the wax block example, for St. Thomas, is that the shape of the signet-ring comes to be in the wax, but not in the same respect as it is in the signet-ring. Finding significant the fact that Aristotle says that the seal is received both without the gold and *not as gold*, St. Thomas comments, hence wax, he says, takes a sign, i.e., a shape or image, of what is gold or bronze, but not precisely as gold or bronze. For the wax takes a likeness of the gold seal in respect of the image, but not according to the disposition of gold. (Ibid., n. 554.) It seems that, for St. Thomas, the fact that the image received is a negative or reverse of the seal, (and so the wax has the image but not as the gold has it) is analogous to what is distinctive of sensation. That is, the fact that the image is in the wax in a different way than it is in the ring illustrates the fact that the sensible form is in the organ in a way different than it is in the object. For, the wax does not have the image to the extent that it can cause another impression, and so it is not a seal-like image; it lacks "the seal's intrinsic disposition to be a gold seal." Analogously, sense organs do not take on the forms of their sensible objects to the extent that they can again be perceived; the sense

> is not affected by a colored stone precisely as stone, or sweet honey precisely as honey, because in the sense there is no such disposition to the form as there is in these substances; but it is affected by them precisely as colored, or tasty, or as

> having this or that 'informing principle' or form.
>
> [Incidentally, this blocks the possibility of indirect realism since affections to sense organs cannot serve as objects of awareness in their own right.]

Since physiological/alteration interpretation can offer no other explanation of Aristotle's words "without the gold and not as gold," it seems that St. Thomas' reading accounts for more of the text, and reflects Aristotle's intention.

Therefore, just on the basis of *DA* 2.12, when the organ receives form without matter, it receives the same form as its object, but not as that form is in the object. Aristotle is explicit that sense is like the wax which receives an impression both without gold and not as gold. Understanding sensation as a standard alteration allows no rationale for this qualification. In fact, the qualification seems to invalidate this interpretation since on this view the wax takes on the shape *just as* the gold has it, and the sense organ takes on, the sensible quality just as the object has it, i.e., literally, and so is altered. St. Thomas, at least, explains Aristotle's qualification as indicating that the organ does not receive the form in a material way, i.e., not as an alteration. The alternate interpretation, that of St. Thomas, accommodates the view that a sense organ does not receive the matter of the object, since in no kind of alteration does the agent receive the matter of the agent, much less does a sense organ receive the matter of its object.[13]

Opposition to interpreting the reception of form without matter as referring to physical alterations should not be seen as the denial of any physical process, however. Thomas holds that the reception of form without matter nevertheless takes place *in material organs*. Aristotle also explicitly applies the theory to sense organs, and so the theory must be meant to identify a physical process, but one that is not an alteration in the normal sense. In *DA* 3.2 (425b22-24), Aristotle claims that it is the *sense organ* of sight which is receptive of form without matter. Given that the theory of reception of form without matter is not alteration, this implies that what goes on in the organ is the same as what goes on in the power. As Kurt Pritzl summarizes, "Sensation would seem to be a single alteration of the ensouled body which is a living functioning sense organ."[14] Indeed, it seems to be Aristotle's intention that perception is a physical process which is nevertheless not an ordinary, i.e., standardly material, alteration. Aristotle believes that perception is an activity, not a standardly material alteration, which is

realized in sense organs.

VII. Physical Activity of Sensation

A peculiarity about perception, i.e., the case of several perceivers perceiving the same object, confirms that even the process occurring in the sense organ could not be an ordinary alteration. This problem was in fact faced by Aristotle in *De Sensu*.

> But some find a further difficulty in this; for they say that it is impossible for one person to hear or see or smell the same thing as another; for they argue that it is impossible for several separate persons to hear or smell the same thing; for in that case a single thing would be separate from itself. The original cause of the movement, *e.g.*, the bell, or the incense, or the fire, which all perceive, is the same and numerically one, but the subjective perceptions (αισθονονται) though specifically the same, are numerically different, for many see, smell, or hear at the same time. These are not bodies, but are an affection or movement of some kind (for otherwise the effect would not be what it is), though they imply body (*De Sensu* 6, 446b17-27).

In this passage, Aristotle is clear at least that the affections of perceivers are not bodies, but are "affections or movements" which imply body. This seems to indicate that they are straightforwardly alterations which the perceivers suffer. However, if that were the case, Aristotle would be granting the objection, and the various perceivers would have numerically different affections. It seems, however, that he is denying the objection, and when he says they are movements "of some kind," he is qualifying the sense in which they are alterations, indicating that if they are, they are not a straightforward kind. However, the fact that the perception is of one and the same object shows that the affection of the perceivers (in their organs) is not an ordinary alteration, for in that case, *ex hypothesi*, it would not be of one object, but of several. Thus, in order for the perceivers to actually perceive one object, they have to be affected in a way that is not an ordinary affection, and in the case under consideration, it is granted that they do perceive the one object. Therefore, although it is an affection of some kind, the process that a perceiver undergoes is not an ordinary alteration.

VII. Relevance of Aristotle's Insights

Embedded Mental States

On Aristotle and St. Thomas' understanding of them, coming to be in a mental state is not the destruction of some prior state, but rather the fulfillment and completion of the knowing power. In both the *Physics* and the *De Anima*, I hope it is clear, Aristotle denies that even sensation is a kind of alteration. Instead, in *Physics* VII, he says that "knowing and understanding imply that the intellect has reached a state of rest and come to a standstill and there is no becoming that leads to a state of rest" (247b10-11). The point seems to be that in passing from one mental state to another, old states are not necessarily destroyed, and new states do not replace them. Rather, the new state of knowing that is the result of prior knowledge is like finishing a project or building up knowledge, and thus it is apt that Aristotle invokes an analogy with house building. Just as a house under construction is not altered by adding a roof to it, so the mind does not undergo an alteration in having a new mental state. The subsequent states supersede the prior, and build on and complete them. The mind, then, is in a state of rest when it acquires its new non-material mental states. It is clear, too, that St. Thomas, building on Aristotle, believes that no mental state is a transmutation. As such, they cannot be functional states, even of spirits. Functionalism, despite assertions to the contrary, is a thoroughly materialist theory for the mind, since it necessarily requires the systems realizing functional states to undergo material alterations in the process of their mental functioning.

Functionalists seem to have gotten their start by noting the successes of computer scientist in modeling human cognitive behavior. One, however, should not press the similarity between computers and human cognition too far. Even if computers do something of what we do, or we do what they do, i.e., go through a series of steps or states in executing an algorithm, it need not follow that we are or could be functionally isomorphic to a computer. The new states into which we pass in thinking discursively, i.e., as through series of steps, do not seem to entail the destruction of previous states. For when we reach the conclusion of a syllogism, "Socrates is mortal," it does not seem that we forget, or even really cease to think that "Socrates is human" and "To be human is to be mortal." Rather it seems to be the case, as it certainly did for St.

Thomas, that we understand that being human is the reason why Socrates is mortal. The premises seem to be implicit in the conclusion.

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[1] Hilary Putnam, "Brains and Behavior," in Block, ed., *Readings in Philosophy of Psychology*, (Cambridge, MA: Harvard University Press, 1980), p. 36.

[2] Putnam, "Philosophy and Our Mental Life," in *Readings*, p. 134.

[3] They are unspecified because we will want to say that they can be realized in humans, lions, Martians, etc.

[4] Martha Nussbaum, ed., *Aristotle's De Motu Animalium: Text with Translation, Commentary, and Interpretive Essays*, Essay 1, (Princeton: Princeton University Press, 1978), p. 71.

[5] Steven Everson, *Aristotle on Perception* (Oxford: Clarendon Press, 1997).

[6] "Why Functionalism Didn't Work," in *Words and Life* (Cambridge, MA: Harvard University Press, 1994), p. 441.

[7] Richard Boyd, "Materialism without Reductionism: What Physicalism Does Not Entail," in *Readings*, p. 101.

[8] Ned Block, "What is Functionalism?" in *Readings*, p.181. See also Putnam, "Philosophy and Our Mental Life," p. 142.

[9] Sisko also believes that *Phys*. VII. 3 shows that a denial of material alteration is false. 142-3.

[10] Indeed, this seems to be Aristotle's point in *Meta* 10. 6: an activity continues even after it is completely actualized, whereas a motion ceases upon the completion of its actualization. Cf. J. L. Ackrill, "Aristotle's Distinction between *Energeia* and *Kinesis*" in *Essays on Plato and Aristotle* (Oxford: Clarendon Press, 1997), and Sarah Waterlow, *Nature, Change and Agency in Aristotle's Physics* (Oxford: Clarendon Press, 1982), pp. 183-186. Aristotle's opposition between motion and activity precludes actual perception being a motion. What I hope to show is that the requirements for perception as an activity extend to the processes occurring in sense organs. This fact, then, blocks Everson's contention that there is a κινησις (alteration$_1$) in the eye, and an ενεργεια (alteration$_2$) in the faculty of vision supervening on it.

[11] Sorabji, "Body and Soul in Aristotle," p. 172.

[12] *Sentencia Libri De Anima*, Book II, Lecture 24, n. 551, pp. 171-2.

[13] See T. K. Johansen, *Aristotle on the Sense-Organs* (Cambridge: Cambridge University Press, 1998), pp. 274-280.

[14] Kurt Pritzl, "On Sense and Sense Organ in Aristotle," *Proceedings of the American Catholic Philosophical Association*, (1985), p. 261.

SCG 3, 104 [9] Again, if anything is moved by a principle of life, it must have sense power: the mover is, in fact, sense or understanding. Now, understanding is not present in things subject to generation and corruption, without sensation. But sensation cannot be present where there is no touch, nor can touch be without an organ that has a balanced mixture of sensory qualities. Now, such a balanced mixture is not found in stone, or wax, or metal, from which a statue is made. Therefore, it is not possible for these statues to be moved by a principle of life.