most radical expressions of moral cynicism in the late fifth century are to be found in dramatic dialogue with fictitious characters, like Sisyphus and the Unjust Logos of the Clouds, or in the semi-fictional context of the Melian Dialogue. Even the fragments of Antiphon seem to be more circumspect, less aggressively hostile to morality. We can only imagine what Athenians of this period would have said or thought in private. Probably no public figure and no author writing in his own name would be as outspoken as these three literary characters are, or as Callicles will be later in the pages of the Gorgias. That is presumably why the Sisyphus text is so extraordinary: the conventions of the theater allow the gangster type to speak openly.24

University of Pennsylvania

What’s Wrong with the Aristotelian Theory of Sensible Qualities?

TODD STUART GANSON

Recent historical work on the distinction between primary and secondary qualities has emphasized the extent to which the authors of this distinction were motivated by an interest in supplanting prevalent, Peripatetic assumptions about the nature of sensible qualities.1 For example, Margaret Wilson writes

As I have repeatedly indicated, it is now pretty clear what seventeenth-century writers were basically aiming at in articulating their positions concerning sensible qualities. They were, above all, explaining and advocating a view of the relation between sense experience and physical reality which they saw as rivaling and replacing recently dominant Aristotelian-Scholastic assumptions, a view consistent with a dramatically more successful and fundamentally different science of nature. (Op. cit., 242)

This insightful perspective invites us to ask whether the proponents of the mechanistic philosophy succeeded in undermining the Aristotelian-Scholastic theory of the ontological status of sensible qualities.

My attempt to address this large issue will be limited in two respects. First, I will leave aside Scholastic developments and focus on the central tenets of Aristotle’s position. Second, Galileo and Descartes will represent the opposition to the Aristotelian tradition; lesser and later champions of mechanism will not be discussed here.

Galileo vs. Aristotle

The Mechanists and the Peripatetics disagree about what the fundamental properties of material bodies are. As anyone familiar with Aristotle’s

24 Note that in a later, more cynical age, a view not unlike that of Sisyphus will appear in the respectable pages of Polybius (VI.56.11-12).

biological writings knows, Aristotle’s explanations of natural phenomena routinely invoke the properties heat and coldness. In fact, Aristotle believes that these are among the most fundamental features of matter in the sublunar realm. Galileo and other Mechanists, of course, deny that heat is among the “primary” properties of bodies, i.e. the explanatorily basic properties of things.

Not only does Galileo reject Aristotle’s assumption that heat is among the fundamental properties of bodies; he denies that heat has any role to play in scientific explanations of natural phenomena. Similarly, colors, flavors, odors and sounds are not among the explanatory features of the world: scientific accounts of how things are will not mention these sensible qualities. The specific point of disagreement I wish to highlight is the following. Aristotle endorses, while Galileo firmly opposes, the causal thesis (hereafter “CT”):

Sensible qualities figure in explanations of our sense perceptions: they are causally responsible for our perceptual experiences of them.

Before we consider whether or not this thesis is defensible, I want to substantiate my view that Aristotle consistently maintains CT, a rather involved task.

A number of texts indicate Aristotle’s attraction to CT (see, e.g., de Sensu 6, 445b6-7; Meteorology IV.8, 385a2-4; de Anima II.12, 424a21-24), but I will concentrate on the following two passages:

A. Aristotle, de Sensu 3, 439a6-17

In the writings on the soul we spoke generally about the perceptibles corresponding to each of the sense organs (I mean color, sound, odor, flavor and touch): what their work is and what their activity is with respect to each of the sense organs. It must be investigated what account it is necessary to give of these, e.g. what color is, what sound is, what odor is, what flavor is, similarly concerning touch, and first concerning color. Each is spoken of in two ways:

2 See de Generatione et Corruptione II.2.
4 The sensible qualities, on Galileo’s view, are effects on our bodies, not the causes of these effects. Now these effects may play some explanatory role in psychology, but sensible qualities will not figure in explanations of the natural phenomena around us.

[a] in activity and [b] in potentiality. [a] The color in activity and sound, how <each> is the same as or different from the perceptions in activity, e.g. seeing and hearing, has been said in the writings on the soul. [b] What each of these is such that it will make perception and activity, let us now say.

B. Theophrastus, de Sensibus 89

With respect to the natures of the flavors, he <Plato> does not say what each is . . .; rather, he makes clear the effects (ta pathê) which come from them. For <the claim> that the harsh or astringent flavor contracts the pores, and that the saline flavor cleanses them, which just is an affection (pathos) of us; similarly with the other flavors. But we seek their essence (tên ousian) more and why they do these things, since we observe the effects.

These early Peripatetics apparently assume that inquiring into the natures of sensible qualities and explaining the powers of these qualities to produce effects on our sense organs are parts of the same inquiry. How exactly are these undertakings supposed to be connected? I will argue that Aristotle identifies sensible qualities with the grounds or causal bases of powers to produce perceptions, so that investigation of the causes of our perceptual experiences leads us to the natures of the sensible qualities, and vice versa.

On a familiar alternative reading, Aristotle identifies colors, not with the causal bases of powers to affect perceivers, but with activations of such powers. Roderick Chisholm, in his chapter on secondary qualities in Perceiving, offers what he takes to be Aristotle’s reasoning about the causal role of colors and flavors:

... Aristotle’s own statement is more paradoxical than it needs to be. He points out, in effect, that a physical thing, at times when it is not being perceived, may yet have a “power” or “capacity” to stimulate the sensing of sound, color, flavor, or the like; for the thing may be such that, if certain conditions were to be realized, it would cause sensing to occur in these manners. And from this fact he concludes that such things, when they are not perceived, have potential, but not actual, sounds, colors, or flavors.

Chisholm speaks of the object as having the power to produce the sensing of color. Color cannot have this power and cannot play the causal role required by CT, for, as C.C.W. Taylor explains, colors are mere activations of powers to produce certain sensory contents:

5 (Cornell, 1957), 129.
6 Color, on this interpretation, cannot causally explain color perception, for this reading makes actual color one and the same as actual seeing (see below). Actual color is therefore an explanandum of the causal relation of perceiving, not an explanans.
... the specific nature of a given colour or taste is just that it is the content of a perceptual act: red is what you see when you look at a poppy with normal vision in normal conditions, sweet is what you taste when (subject to the same qualifications) you taste honey, and so on. So if the objective feature is just what is realized in the perceptual act, all that is "out there" prior to the act is the potentiality for the realization of just that feature.7

Whether or not the specific nature of a given color is presented in normal perceptual acts (an issue I will turn to a bit later), I want to insist that that nature is something "out there" independent of its being perceived, something causally responsible for perceptual experiences.

On what grounds do Chisholm, Taylor and others8 attribute to Aristotle the view that sensible qualities are identical with activations of powers to produce perceptions? In *de Anima* III.2 Aristotle seems to be saying that the capacity to sound and the ability to hear are coordinate in the following sense: an object can realize its capacity to produce a sound when and only when a suitably related creature is realizing its capacity to hear. Aristotle apparently identifies (or at any rate does not distinguish) the capacity to sound and the power to produce hearing, so that actual sound and actual stimulating of the auditory faculty are one and the same. Similarly with colors, flavors and the rest – objects only potentially have these qualities when they are not actively producing sensation; hence, Aristotle distinguishes color in potentiality from color in activity, as in text A. Color in potentiality, on this reading, is what is potentially, but not actually a color. The activity of this potentiality – color in activity – is actual color.

I am going to defend a rather different interpretation of Aristotle’s distinction between color in activity and color in potentiality: Aristotle is setting apart a color’s power to cause seeing from its activation of that power. Upon working out my interpretation, I discovered that this alternative way of understanding what Aristotle says has a history among the ancient commentators. I want to survey this history, and explain how Simplicius improved upon a suggestion of Alexander.

Alexander’s interpretation of Aristotle’s distinction between the sensible quality in activity and the sensible quality in potentiality involves three important assumptions. The first assumption is revealed at the very beginning of his commentary on *de Sensu* (hereafter “*in de Sensu*”) where Alexander sets out a couple of issues about sensible qualities which he takes Aristotle to address in *de Sensu*:

... further, concerning the objects of perception, [i] what the object of perception is for each sense, and [ii] in virtue of being what in its proper nature being perceptible belongs to <the sensible quality>, since for the sensible quality being and being perceptible are not the same... (*in de Sensu*, 1.14-17)

Alexander assumes that Aristotle differentiates the sensible quality, e.g. the color, from the capacity being perceptible, in this case being visible. Alexander may have in mind passages such as *Physics* III.1, 201a29-b5, where color and visible are said to be coextensive9 but distinct properties.

The second assumption of Alexander’s reading is that the activities (i.e. activations) of color and of visible are distinct. Commenting on text A, Alexander writes:

For the color in activity is not the same as the sight in activity, nor is the sound in activity the same as the hearing; for these are able to be in activity even when not being seen, but it is no longer possible for them to be perceptible in activity without perception. (*in de Sensu*, 42.7-10)

A color can be in activity (i.e. activated) even when nothing is perceiving it. The same is not true of the property visible; things are visible in activity (i.e. they are activating their capacity being visible) only when they are being seen. *Physics* III.1 may again be at the back of Alexander’s mind. Aristotle tells us here that the activity of the color is distinct from the activity of the property visible (201a35-b4).

The third assumption of Alexander’s interpretation is that when Aristotle speaks of the sensible quality in activity in *de Sensu* 3, he is talking about an activity of the property perceptible. Alexander’s strategy is to interpret the following portion of text A:

---


9 Not necessarily coextensive, as Hussey suggests in his note on this passage (see *Aristotle’s Physics III and IV* (Oxford, 1983)). I argue elsewhere (“Aristotle’s Third Type of Relational Property,” unpublished) that, on Aristotle’s view, there would be colors in a world without perception, but those colors would not be visible; hence, these properties are not necessarily coextensive.
The color in activity and sound, how <each> is the same as or different from the perceptions in activity, e.g. seeing and hearing, has been said in the writings on the soul. (de Sensu 3, 439a13-16)

as follows:

The color perceptible in activity and the sound perceptible in activity, how they are the same as, on the one hand, the sight in activity, on the other, the hearing in activity, and in what respect they are different, has been said in the writings on the soul. (in de Sensu, 42.10-13)

Where the usual reading takes Aristotle to be differentiating actual color from the potentiality for actual color, Alexander believes that Aristotle is distinguishing two states of an actual color: a color’s being perceptible and a color’s activating this capacity being perceptible.

I believe that Alexander is on the right track, but there are a couple of significant objections which will force us to emend and add qualifications to his proposal.

Objection 1. Aristotle speaks of the sensible quality as in activity, not the property perceptible, as Alexander suggests. How do we make sense of this fact if we think that Aristotle is talking about the activities of properties like visible and audible?

Simplicius¹⁰ provides us with a nice answer to this question. He makes the same three assumptions which characterize Alexander’s alternative, but his paraphrase is much less obstructive than Alexander’s. On his reading, it is the color which is in activity, but it is not in activity qua color; rather it is in activity qua visible. He writes:

There is activity of the sense whenever one perceives, but there isn’t activity of the object of perception whenever there is color or whenever there is sound, but whenever <the color or sound> is perceptible, so that it is in activity qua perceptible. (in de Anima, 191.10-12)

The color has a power such that it, the color, is in activity when it is being seen; it is in activity because it is visible (i.e. because it is activating its capacity being visible). Alexander suggests that Aristotle’s phrase “color in activity” is short for “color which is visible in activity,” where “in activity” modifies the understood predicate “is visible.” Clearly this reading requires that Aristotle is expressing himself in an exceptionally elliptical manner. Perhaps as a response to this problem with Alexander’s suggestion, Simplicius glosses “color in activity” with “color in activity qua visible,” so that “in activity” modifies “color.” The color is in activity because it is activating its capacity being visible.

Simplicius’ proposal is a clever strategy for fitting Alexander’s insights with Aristotle’s text. Let me explain his reading a bit further by reference to relevant passages in Aristotle’s de Anima.

For Aristotle, being perceptible is not simply having the passive capacity to be perceived; it is also an active power to act on or affect the senses in a certain way. So in de Anima II.10 Aristotle remarks that “taste is affected by the tasteable (to geuston) qua tasteable” (422b2-3), and that “the faculty of taste is potentially such <bitter, sweet, etc.>, but what can make (to poiëtikon) it actually <such> is tasteable” (422b15). Being tasteable is having the power to act in a certain way on the sense of taste. Similarly, being smellable is having the power to act on the sense of smell in a certain manner. In de Anima II.12 Aristotle asks whether things incapable of perceiving can be affected by sensible qualities such as colors and smells. Toward a response to this question, he says “If odor is the smellable (to osphranton), if it makes something, odor makes smelling” (424b5-6). This passage explicitly calls the capacity of odor to produce smelling osphranton.

Aristotle is claiming that when an odor causally interacts with a faculty of smell in such a way as to produce actual smelling, that odor is realizing a capacity, a capacity to affect the faculty of smell. Aristotle refers to this capacity generically by the term aisthēton (perceptible), specifically by the term osphranton (smellable). The activation of this capacity is an activity of the odor, an activity it undergoes because it is smellable or qua smellable. Presumably an actual odor needn’t activate this capacity, though an odor which is in activity qua smellable is activating this capacity.

Objection 2. Themistius’ paraphrase of de Anima III.2 follows Alexander’s reading of de Sensu 3:

The activity of the perceptible and of the sense faculty is one and the same, though their being is not the same. I mean that what is audible in activity and the hearing are the same, and what is visible in activity and the seeing; for it is not possible to be audible in activity without hearing, nor visible in activity without sight. But what is audible in potentiality and the hearing in potentiality are able to be separated from one another; for it is possible, having hearing, not to hear, and it is possible, being audible, not to be heard, e.g. the sound. (in de Anima, 83.35-84.2)

¹⁰ The authorship of the commentary on de Anima attributed to Simplicius is a matter of much dispute. For references to recent discussions of the issue see the Addendum to Blumenfeld’s “Neoplatonic Elements in the de Anima Commentaries,” in R. Sorabji (ed.), Aristotle Transformed (Cornell, 1990). I do not take a stand on the issue here.
On Themistius’ reading, Aristotle is distinguishing between a sound’s being audible and its activation of that potentiality, but when we look at the relevant passage in de Anima we find that Aristotle is talking about the capacity to sound, not the power being audible:

The activity of the perceptible and of the sense faculty is one and the same, but their being is not the same. I mean, e.g., the sound in activity and the hearing in activity. For it is possible, though one has hearing, not to hear, and what has sound doesn’t always sound. But whenever what is able to hear is in activity and what is able to sound sounds, at that time the hearing in activity and sound in activity come about simultaneously; one might call the one “hearing,” the other “sounding.” (425b26-426a1)

We want to understand why Aristotle speaks of the capacity to sound where we would hope for talk of being audible.

There seems to be a more general question at hand: Why is it that Aristotle is often reluctant to use the term akouston (audible)? For example, de Anima II.8, Aristotle’s discussion of sound and hearing, does not contain an instance of the word akouston, while the chapters on the other four senses each begin, in the very first sentence, by mentioning the specific potentiality associated with the sense: II.7 mentions horaton (visible), II.9 osphranton (smellable), II.10 geuston (tastable), II.11 hapton (tangible). Instead of akouston, de Anima II.8, like de Anima III.2, speaks of the capacity to sound, sometimes using the term psophētikon. And in de Anima II.11, Aristotle groups together psophētikon, horaton, osphranton and hapton as of the same sort (423b5-6 and 423b12-15). Why doesn’t Aristotle use the term akouston in these contexts where we most expect him to do so?

Here is a suggestion. Aristotle needs two terms, akouston and psophētikon, because, when we are talking about the capacity of an external object to produce perception, akouston seems somewhat inappropriate since it is the sound — not the object which produces the sound — which is strictly speaking audible. In the case of flavor, the feature of the external object which produces the sensation of sweetness is itself the object of taste, namely the flavor. Similarly in the case of smell, the feature of the rose which produces that familiar sensation is itself the object of smell. The exception is the case of sound: the feature of the external object which produces the auditory experience in the subject is not, strictly speaking, the object of hearing. What one hears is the sound, and the sound is not a feature of the object which produces it. Objects have odors, flavors, colors, and temperatures, but they do not have sounds; they make sounds. This asymmetry explains the following important difference: taste is affected by the tasteable qua tasteable (422b2-3), but hearing is affected by the object qua capable of sounding (psophētikon).

Aristotle’s choice to illustrate his position with the case of sound is unfortunate, since it misleads the reader. Had he instead focused on the example of flavor, it would have been clear that the gustatory faculty is affected by the flavored object qua tasteable. I will return to the problematic case of the capacity to sound in a moment.

So far I have been responding to objections to Alexander’s reading. I now want to illustrate some of its virtues. Aristotle introduces his distinction between the sensible quality in activity and the sensible quality in potentiality in de Anima III.2 where he makes three points about the agent and patient involved in the relation of perception: the activity of the sensible quality and the activity of the sense faculty are (A) one and the same, (B) both located in the sense faculty, and (C) simultaneously preserved or destroyed. I will look at each of these three theses in turn, suggesting that our alternative interpretation of the distinction makes Aristotle’s position coherent where the usual reading embraced by Chisholm and Taylor does not.

(A) The activity of the sensible quality and the activity of the sense faculty are one and the same.

According to Aristotle’s account of causal action in Physics III.3, the capacity of the agent to act and the capacity of the patient to be affected have one and the same operation or activity — what we might call a “joint realization” — when the agent and patient causally interact. The capacity of the teacher to teach and the capacity of the student to be taught, i.e., learn, are clearly distinct properties, but they have a joint realization, according to Aristotle, when the teacher teaches the student.11 Aristotle

11 Let’s distinguish the activities of the two capacities, calling the one “teaching,” the other “learning.” Does Aristotle think that the converse relations expressed by these words are identical? He certainly says that they are one and the same, but he also says the following: “all the same things do not belong to those the same in any manner, but alone to those whose being is the same” (202b14-16). Inferences in accordance with Leibniz’ Law are only licensed where things the same in being or account are concerned, but the activity in the student of the teacher’s power to teach and the activity of the student’s capacity to learn brought on by the agency of the teacher are not the same in account: “the activity of this in this and the activity of this by this are other in account” (Physics III.3, 202b21-22). So it seems that A’s teaching B and B’s being taught by A are not identical activities.

I do not think we should accept Irwin’s reading (see “Aristotelian Actions,” Phronesis (1986), 71-3) according to which Aristotle accepts that this token teaching
believes that the relation of perceiving is a causal relation conforming to this account, so that "the activity of the perceptible and of the sense is one and the same . . ." (425b26-7).

On the usual reading, Aristotle is claiming that actual color is one and the same as actual seeing; actual color is tied up with actual seeing in the way that actual teaching is tied up with actual learning. However, color is defined in *de Anima* II.7 as a capacity to change light (the diaphanēs in actuality; see 419a9-11 and 418a31-b2), suggesting (i) that there would be actual (though inactive) colors even in the dark where they cannot be seen, and (ii) that the activity of color is tied up, not with sight, but with light. The latter point is explicitly brought out in *de Anima* III.5: "For in a certain way light makes colors being in potentiality colors in activity" (430a16-17). Aristotle's definition of color does not seem to fit with the claim that something must act on a faculty of sight in order for there to be actual color.

Our alternative reading avoids this difficulty. Color is a power to change light in a certain way, and it is in virtue of being this power that color has the ability to affect sight in a certain way (see 419a13-15, a26-28; cf. 434b27-29). An actual color needn't realize this latter capacity.

(B) The activity of the sensible quality and the activity of the sense faculty are both located in the faculty.

Aristotle begins *Physics* III.3 as follows:

And the thing puzzled over is evident, that the change is in the thing changed; for it is an activity of this by what is capable of producing change. (202a13-14)

In cases of causal action the change takes place in the patient. For example, when the teacher teaches the pupil, the change is located in the pupil. In *de Anima* III.2 Aristotle draws a consequence from this view of his:

Indeed, if the change or the action is in the thing acted upon, then the sound <in activity> and the hearing in activity must be in the faculty. For the activity of what is capable of acting and productive of change arises in what is affected; for which reason it is not necessary for what changes <something> to be itself changed. . . . (426a2-6)

is identical with this token learning, but denies that the properties teaching and learning are the same in being. For when Aristotle says "the activity of this in this and the activity of this by this are other in account," it is difficult to see how he could be speaking of anything but token activities, denying that they are strictly the same. Apparently, then, Aristotle believes that certain coordinate capacities have realizations which are equivalent in some sense weaker than identity.

Sound in activity, Aristotle tells us, is necessarily located in the faculty of hearing.

On the usual reading of this passage, Aristotle is drawing the conclusion that actual sounds must be located in the faculty of hearing. This reading is evidently incompatible with Aristotle's account of sound in *de Anima* II.8. Sound, he tells us, is a motion of the air (420b11), and although there is air which is built into the ear, Aristotle explicitly states that the motion of the air in the ears is not sound; rather, sound is external and not private (420a17-18). Since Aristotle assumes that the objects of perception are in general external (417b19-28), he would be inconsistent in holding that actual sounds and colors, objects of perception, are located in sense faculties.

If we follow Alexander, we can easily avoid this problem. Sounds are external to the perceiver, but when a sound acts on a faculty of hearing so as to produce actual hearing, the activation of the capacity to produce hearing is located in the faculty acted upon.

A further point should be made concerning the location of sound in activity. Aristotle also draws a distinction between sound in activity and sound in potentiality in *de Anima* II.8, but there is reason to doubt that the distinction is the same as what we find in *de Anima* III.2. The passage from II.8 runs as follows:

Let us now first determine matters concerning sound and hearing. Sound is twofold; for there is a sound in activity and a sound in potentiality. For some things, we say, do not have sound, e.g. sponge and wool, while some do, e.g. bronze and as many things as are solid and smooth, because they are able to sound, i.e. are able to make sound in activity between themselves and hearing. (419b4-9)

Aristotle goes on to mention three necessary conditions for the production of sound in activity: there must be something striking, something struck, and something in which the sound in activity arises, e.g. air. So when Aristotle says that things able to sound can produce sound in activity between themselves and hearing, he is claiming that sound in activity arises in the air between the object struck and the organ of hearing. This claim clearly does not cohere with *de Anima* III.2 which states that sound in activity is located in the faculty of hearing. This difference between the two passages is not a trivial one; it shows that sound in activity in III.2 is a result of action on the faculty of hearing, while sound in activity in II.8 is a result of action on air by a thing struck.

It seems, then, that *de Anima* II.8 recognizes a kind of sound in activity which can exist without being heard. Sound in activity requires the presence of something striking, something struck and some medium, but
there is no suggestion that the presence of a faculty of hearing is a necessary condition for the production of sound in activity. One might suppose, though, that the existence of sound in activity requires the presence of hearing, since the ability to sound is defined as the capacity to produce sound in activity between the object and hearing. But the reference to hearing in this definition presumably has the purpose of indicating that what is able to sound must be able to move air as far as the ears without the air entirely dispersing, as in the following: “the capacity to sound is the capacity to move a single, continuous portion of air up to hearing” (420a3-4).

I cannot see how to fit these two discussions of the capacity to sound together. I suspect that II.8 captures Aristotle’s considered opinion: the capacity to sound is a capacity of an object to affect air. When Aristotle wrote de Anima III.2 he recognized that he needed a term other than akouston (audible) to designate the capacity of an object to produce hearing. Psophētikon (the capacity to sound) seemed a natural alternative, but in fact it failed to express what he wanted.

(C) The activity of the sensible quality and the activity of the sense faculty are simultaneously preserved or destroyed.

In the following passage Aristotle draws a consequence from his thesis that the activity of the sensible quality is the same as the activity of the sense faculty, a consequence which has long been thought to make his position incoherent:

Since the activity of the perceptible and of the sense faculty is one, though their being is different, it is necessary that the hearing and sound spoken of in this way be simultaneously destroyed or preserved, and also flavor and taste, and the others similarly, but this is not necessary in the case of the things spoken of potentially. (426a15-19)

The usual reading takes this passage to express a subjectivist thesis about sensible qualities, that there are no actual, unperceived colors, flavors, etc. Some who accept this reading recognize that Aristotle cannot consistently maintain a subjectivist view of the sensible qualities. The problem was, to my knowledge, first noted by G.R.T. Ross in his fine commentary on de Sensu (see op. cit., 149-150). More recently the difficulty has been well stated by Taylor:

Aristotle, in short, faces a dilemma. He holds both that the sense-object acts on the faculty by imposing on it the form which it actually has, and that before the perceptual act the sense-object has its form only potentially, acquiring it actually in the act of perception; yet these claims are incompatible. (Op. cit., 140)

Aristotle claims that the faculty of perception is potentially what the perceptible is already in actuality (entelecheiai, 418a3-4), implying that the perceptible is actual prior to being perceived (see 417a17-18 with which cf. Met. IX.8, 1049b24-27), but on the usual interpretation of de Anima III.2 the perceptible is potential, not actual, prior to being perceived.

On our alternative, Aristotle’s position is perfectly consistent. The grass is actually green before Callias looks at it, but the green of the grass is not in activity qua visible before Callias or someone else sees it.

The coherence of Aristotle’s views on perception is clearly at stake here. We should avoid the usual reading of de Anima III.2 if a reasonable alternative is available. I believe that Alexander and Simplicius offer just what we want, and I will assume from here on that Aristotle consistently maintains CT.12

Aristotle differentiates the secondary quality (the capacity to produce perception) from the sensible quality (the color or flavor). On the assumption that colors and flavors must satisfy CT, i.e. must be able to cause perceptions in appropriately related perceivers, this distinction makes a lot of sense. For secondary qualities clearly do not causally explain our perceptions. The power is not what produces the experience; what produces the experience is whatever explains or grounds the power. Their commitment to CT makes it reasonable for the Peripatetics to identify colors and flavors with properties whose natures ground or explain the secondary qualities of things.

According to Alexander, Aristotle acknowledges this grounding relation in text A:

Each <sensible quality> is spoken of in two ways: [a] in activity and [b] in potentiality. [a] The color in activity and sound, how <each> is the same as or

12 Other passages might appear to speak against attributing CT to Aristotle. For example, at Metaphysics IV.5, 1010b31-35, Aristotle states that ta hupokeimenata produce perception, and this has been taken as a denial that sensible qualities are causally responsible for our perceptions (see Ross, Aristotle: Metaphysics, v. 1, 278, and Gottlieb, op. cit., 116ff). But there is no reason why the phrase “the subjects which produce perception” cannot refer to the sensible qualities. In a number of passages in de Anima (see 422b32, 425b14, 426b8, b10), Aristotle speaks of the proper object of a sense as the subject (hupokeimenon) of that sense. So when Aristotle has trouble finding the proper object of touch he says “what the one subject (to hen to hupokeimenon) is for touch, as sound is for hearing, is not evident” (422b32-3).

Aristotle, I suggest, employs this familiar use of hupokeimenon in this Metaphysics passage. For it is precisely the hupokeimenon of a sense which causally acts on the sense so as to produce perceiving.
different from the perceptions in activity, e.g. seeing and hearing, has been said in the writings on the soul. [b] What each of these is such that it will make perception and activity, let us now say.

The sensible quality in potentiality, the sensible quality qua capable of producing perception, is going to be explained by reference to the nature of the quality. On Alexander’s reading, Aristotle is going to tell us

... in virtue of being what in its proper nature being perceptible belongs to <the sensible quality>, since for the sensible quality being and being perceptible are not the same... (in de Sensu, 1.15-18)

The capacity of a sensible quality to produce perception has as its causal basis the intrinsic nature of the quality. In this way Aristotle’s theory can accommodate CT.

Let’s turn now to the issue of whether or not CT is defensible, beginning with Aristotle’s very brief argument for it at the beginning of de Sensu 6:

... each of these qualities is capable of producing perception (for it is in virtue of being able to cause perception that all are spoken of)... (445b7-8)

Compare Barry Maund’s claim that CT “is implicit in conceptual practices characteristic of ordinary natural language.” Along similar lines, Mark Johnston proposes that among our core beliefs about canary yellow is the belief that:

The fact of a surface or volume or radiant source being canary yellow sometimes causally explains our visual experience as of canary yellow things. Aristotle’s acceptance of CT, I suggest, exhibits his trust in the beliefs implicit in our common ways of speaking.

In The Assayer, Galileo argues that we have to let go of this commonsense belief that odors, flavors and the rest are genuine, explanatory features of the world around us. His argument is quite simple. He sketches accounts of how our gustatory, olfactory and other perceptual experiences come about, and points out that the sensible qualities do not figure in these explanations. Consider the conclusion Galileo draws concerning how fire brings about its effects on perceivers and other bodies:

In sum, the operation of fire, considered in itself, is nothing but movement, or the penetration of bodies by its extreme subtlety, quickly or slowly, depending upon the number and velocity of tiny corpuscles of flame and upon the greater

or lesser density of the bodies concerned... But that there exists in fire, apart from shape, number, movement, penetration, and contact, some further quality which we call “heat,” I cannot believe. (Op. cit., 60)

The “primary and real” properties of bodies are sufficient to explain all of the causal effects of fire, including its effects on perceivers. There are no grounds, Galileo insists, for recognizing some further property heat, over and above these primary qualities. For such a property would have no explanatory role to play.

Galileo moves a bit too quickly here. Let’s agree that fire’s causal powers are all accounted for by appeal to its primary and real qualities which do not include heat. Are we to conclude that heat has no causal role to play? We can avoid this unhappy consequence if we suppose that heat is identical with that property – whatever it turns out to be – which explains certain familiar effects. Perhaps being hot just consists in having such and such a microstructure, so that a fire’s being hot will explain a number of its effects on things. Galileo’s neglect of this alternative to his eliminativist position is a significant gap in his case against CT.

The alternative we are considering is embraced by Descartes, who attempts to accommodate CT by identifying colors with reflectance properties of objects:

... in the bodies we call colored, the colors are nothing other than the various ways in which the bodies receive light and reflect it to our eyes.

Descartes believes that color is a property of objects “which produces in us a certain very clear and vivid sensation which we call the sensation of color” (Principles of Philosophy, I, 70; AT VIII, 34; CSM I, 218). The relevant causal features of objects are their dispositions to affect incident light, so the colors just are these reflectance properties.

Descartes will readily concede that we should not junk Aristotle’s theory

15 Galileo does not abolish colors and flavors from the world altogether since he thinks that they are features of perceiving subjects. Accordingly, when I call Galileo an eliminativist, I mean that he strips these qualities away from external objects.
16 I am inclined to think that Descartes’ official view is that sensible qualities are identical with those microphysical properties causally responsible for our perceptions of them, so that colors and the rest figure in explanations of our perceptions. However, Descartes does not always seem faithful to this reductive approach (see John Cottingham, “Descartes on Colour,” Proceedings of the Aristotelian Society (1990), 231ff., and Wolf-Devine, op. cit., ch. 2).
on the grounds that it endorses CT. What Descartes wants to dispose of is a certain naive or simple view of the colors and flavors. Let’s look at this naive view and ask whether or not Aristotle is committed to it.

**Descartes vs. Aristotle**

At this point we must consider another common thesis about the sensible qualities, what is sometimes called “the transparency thesis” (hereafter “TT”):

The natures of sensible qualities are disclosed in ordinary perceptual experiences of them; one knows what, e.g., sweetness is just by tasting something sweet.

I see a blue substance in a beaker. Merely seeing the substance doesn’t allow me to grasp its nature: further research is required. What about the blueness of the substance? Do I grasp, just by looking, what the nature of its blueness is? Or is the essence of blueness something hidden from the naked eye, something revealed only through laborious scientific investigation? If you accept TT, you thereby deny that the nature of the substance’s blueness is concealed in the way that the essence of the substance itself is.

Presumably transparency is attractive because it seems to capture something fundamental about the phenomenology of color experience. As Mark Johnston notes,

Perception represents itself as (or is at least spontaneously taken by its possessors as) a mode of access to the natures of things. (“How to Speak of the Colors,” 257)

Gregory Harding captures the allure of transparency in his discussion of the phenomenology of seeing an expanse of cyan:

---


---

The expasne is seen in such a way that the perceiver is able to discern it as it is in itself. This is not merely to say that the expasne is seen in such a way that the perceiver becomes informed that the expasne is such and such in itself, as if the perceiver were told about the expasne, or as if information about the expasne were somehow piped into the perceivers cognitive faculty. Rather, the expasne of color itself is laid bare to the perceiver in a certain way. Specifically, the expasne of color is laid bare to the perceiver in such a way that the expasne itself, as it is in itself, can be discerned by the perceiver. (Op. cit., 294-5)

A theory of color which denied transparency would, if Harding and Johnston are correct, belie the nature of color experience.

On a natural reading of the following passage from Metaphysics IV.5, Aristotle is endorsing TT:

... the same wine would seem to be at one time sweet, and at another time not sweet, either because it changes or because <the subject> body changes. However, sweetness ~ what kind of thing it is whenever it is ~ would never change; rather, <the subject> always has the truth about it, and necessarily whatever is to be sweet is such. (1010b21-26)

Even if the same wine presents dissimilar gustatory appearances (as Protagoras and others are always insisting), sweetness itself ~ what kind of thing it is whenever it is ~ would never change. Furthermore, the perceiver always has the truth about sweetness. What truth is Aristotle talking about here? The subject may be mistaken about which things are sweet, about the extension of sweetness, but in every case where her gustatory experience is as of something sweet, she has the truth about what sweetness is. Theophrastus seems to agree that the nature of sweetness is transparent to us:

However, even if sweetness and bitterness do not come about through the same things for all, at any rate the nature of bitterness (and of sweetness) appears the same to all. (de Sensibus 70)

These passages suggest that Aristotle and Theophrastus are attracted to TT, but Aristotle explicitly notes an exception to this general thesis:

<The nature of> odor and smellable is less easily determined than the things we have already discussed. For it is not as clear what kind of thing odor is as in the case of sound or color. The reason for this is that this sense, as we have it, is not accurate, but is worse than for many animals; for man smells poorly... (de Anima II.9, 421a7-11; cf. de Sensu 4, 440b30ff.)

Due to deficiencies in our olfactory organ, the nature of odor is not transparent to us as the natures of color and sound are.

Descartes, on the other hand, is clearly unhappy with TT. He conceives that there is something “clear and vivid” about our sensations of color,
but he insists that we do not grasp the natures of the colors presented in visual experience:

It is clear, then, that when we say that we perceive colors in objects, this is really just the same as saying that we perceive something in the objects whose nature we do not know, but which produces in us a certain very clear and vivid sensation which we call the sensation of color. (Principles of Philosophy, I, 70; AT VIII, 34; CSM I, 218)

The clarity and vividness of color experience might lead us to suppose that the nature of color is transparent to us, but in fact we are completely ignorant of what it is about color that allows it to produce perceptions in us. However clear and vivid the experience, we are left in the dark about the causal nature of color. Accordingly, there is something significant about color which is not laid bare in experience: namely, what it is about color that makes it capable of producing sensation. For this reason Descartes says that “we do not really know what it is that we are calling a color” (ibid.).

Descartes sees a real tension between CT and TT because he denies that the very property which is responsible for my present experience of blue is something whose intrinsic nature could be laid bare to me in that experience. Consider his remarks about the light-reflecting properties of blue and red things:

The material, as I said, is composed of many small balls which are in mutual contact; and we have sensory awareness of two kinds of motion which these balls have. One is the motion by which they approach our eyes in a straight line, which gives us the sensation of light; and the other is the motion whereby they turn about their own centers as they approach us. If the speed at which they turn is much smaller than that of their rectilinear motion, the body from which they come appears blue to us; while if the turning speed is much greater than that of their rectilinear motion, the body appears red to us. (Description of the Human Body, IV; AT VI, 255-6; CSM I, 323)

On the assumption that something’s being red consists in its having the capacity to affect incident light particles in the above-mentioned manner, we can hardly suppose that the nature of red is revealed in everyday experience. Although the details of Descartes’ account are mistaken, the idea that the spectral reflectance properties of objects are causally relevant to color experience is still with us. Clearly the natures of these dispositions to transform incident light are not transparent to us. (The inadequacy of Descartes’ conception of these powers is sufficient proof of this last point.) Accordingly, Descartes’ hesitation to embrace both CT and TT seems reasonable.

Recently there have been some interesting attempts to harmonize CT and TT in the case of color, but the issue of whether they are in fact compatible is not to the point here. For I am inclined to think that Aristotle, like Descartes, rejects TT. The passages which I discussed above (Metaphysics 1010b21-26 and de Anima 421a7-11) are, at best, inconclusive evidence that Aristotle endorses TT, and there are reasons for doubting that he would be at all attracted to such a thesis.

First of all, other Peripatetics explicitly reject TT. Recall text B, where Theophrastus is attacking Plato’s theory of flavor. According to Theophrastus, Plato fails to account for the natures of the flavors. Instead the discussion in the Timaeus focuses on the effects which these qualities have on our sense organs. Theophrastus complains that these effects are things we observe: what we want to discover are the essences which causally explain the appearances, i.e. the natures of the various flavors. Apparently we do not observe why the sensible qualities have these effects on us – the causal natures of the flavors are not transparent to us. Accordingly, the essences of the flavors are not evident, but must be sought out. Not only does Theophrastus seem to deny the transparency thesis; he may be doing so on the grounds that it is at odds with the causal thesis.

And the author of the Aristotelian de Coloribus seems to think that there is more to the nature of color than meets the eye. He speaks of the obscure (mê euêmon) constitution of the colors (792b1), and tells us that all the differences among the colors require investigation (thêorêteon; b11-12). The mode of investigation described is explicitly empirical, if not experimental. So, like Descartes, the author of de Coloribus supposes that colors have complex, hidden natures revealed only through sustained examination of material bodies.

Both of these Peripatetics were profoundly influenced by the discussion of sensible qualities which follows text A. Theophrastus’ remarkably detailed treatment of flavors in de Causis Plantarum VI and the study of colors in de Coloribus wouldn’t have been possible without Aristotle’s efforts captured in chapters three and four of de Sensu. Recall that in text A Aristotle distinguishes the treatment of sensible qualities in de Anima from his project in de Sensu. In de Sensu Aristotle is going to tell us what colors,

---


20 I assume, with Furley (see “Democritus and Epicurus on Sensible Qualities,” in Brunschwig and Nussbaum (eds.), Passions and Perceptions, Proceedings of the Fifth Symposium Hellenisticum, (Cambridge, 1993), 72-3), that Theophrastus is expressing his own view here at de Sensibus 89.
flavors and the rest are, thereby illuminating how it is that they have the causal effects on perceivers discussed in de Anima. His positive accounts of the colors (ch. 3), flavors (ch. 4), and odors (ch. 5) make it perfectly clear that the natures of these qualities are only unveiled through scientific investigation. (In fact, Aristotle seems to be agnostic about what particular ratios define the intermediate colors and flavors.) Aristotle’s students, seeing that there was still work to be done, continued his researches.

Conclusion

The early Mechanists reject naive conceptions of the causes of our sensible-quality experiences. Galileo believes that a correct understanding of how our perceptions come about will undermine our confidence in the Aristotelian assumption that sensible qualities are genuine, explanatory features of the world around us. Descartes does not agree. We can maintain that colors and flavors are causally efficacious features of things, provided we do not insist that the natures of these qualities are laid bare in experience. Although Aristotle and Descartes have radically different expectations when they consider what scientific accounts of the sensible qualities will look like, their conceptions of the ontological status of these qualities do not seem to diverge: colors and flavors are explanatory properties whose natures are revealed by scientific investigation.21, 22

Cornell University, Ithaca, NY

21 Naturally Aristotle and Descartes have somewhat different reasons for not embracing TT. For Descartes, the natures of the sensible qualities are hidden at the micro-level; Aristotle, of course, does not recognize any interesting microphysical properties. For Aristotle, colors and flavors have a compositional complexity, not unlike the complexity of bodies compounded from the elements.

22 An earlier version of this paper was read at Cornell in the Fall of 1996; I am grateful for the friendly and useful feedback which I received on that occasion. I thank Gail Fine and Sydney Shoemaker, who offered valuable written comments on earlier drafts, and Charles Brittain for discussing a recent version with me. Special thanks to Dorit Ganson, who made numerous suggestions which radically improved the direction and presentation of this project. Terry Irwin tirelessly discussed countless versions of this paper with me, always to good effect. I greatly appreciate his support on this and related undertakings.

Frede and Patzig on Definition in Metaphysics Z.10 and 11

ROBERT HEINAMANN

One of the many difficulties presented by Book Z of Aristotle’s Metaphysics concerns the account of definition in chapters 10 and 11, an account which has been interpreted in a variety of ways. I believe that confusion on this issue has resulted from commentators’ failure to acknowledge Aristotle’s distinction between definitions of composites of form and matter, which must specify material parts, and definitions of forms alone, which must not mention material parts – a distinction mirrored in De Anima I.1’s discussion of the definition of composite psychological events and their forms. Hence, when Meta. Z.11 explains that “some” items (1036b23) cannot be defined without reference to material parts, instead of taking this as a remark on the definition of composite substances, commentators often conclude that Aristotle holds that certain forms must be defined with reference to material parts.

In their splendid commentary on Book Z of Aristotle’s Metaphysics,1 Michael Frede and Günther Patzig have argued that the discussion of definition in chapters 10 and 11 deals with one kind of definition only, viz. the definition of forms. While they do not think that the definition of a form makes an explicit reference to matter, they nevertheless assert that Aristotle’s statement in Z.11 that “the animal is perceptible and cannot be defined without change, nor therefore without its parts in a certain condition” (1036b28-30) is a claim about defining forms.2 According to them, Aristotle’s point is not that such forms are defined with an explicit reference to matter, but rather that such definitions of forms “must make clear the inner connection between form and matter.” So if an animal’s form is defined by defining its soul,4 the definition will make clear that inner

Accepted February 1997

1 Aristoteles “Metaphysik”; Text, Übersetzung und Kommentar (Munich, 1988), vol. II.
4 They alter the text at 1036b28 from αἰσθητόν to αἰσθητικόν.