

REID, ARISTOTLE, AND COLOR¹

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A red ball is still red, even when the lights are off. But a tuning fork has no sound, unless one strikes it. And a rose that emits no tiny particles into the air has no smell. Why does color survive the darkness while stillness terminates sound? "Color" apparently refers to a different sort of thing than "sound." Thomas Reid, however, insists that color and sound are both secondary qualities. By "secondary quality," Reid means the unknown cause of a known sensation.² The senses themselves provide no information about the nature of the cause, but one can discover the nature of the cause through experimentation and induction. By Reid's time, natural philosophers had made some progress in this direction. Reid describes smells as "effluvia of bodies" and sounds as "vibrations."³ However, he describes color as a *disposition* of a body to reflect a particular kind of light.⁴ Why should color be the only disposition among secondary qualities? It should not be. Reid has confused "color," the secondary quality, with "color," the mechanical power of a body. I propose that one can illuminate the problem by comparing Reid's account of color to Aristotle's. However, this analysis does not end in a rejection of Reidian "secondary qualities" or "mechanical powers." Instead, one may graft the Aristotelian distinction onto Reid's account to form an orderly philosophy of color in Reidian terms.

Color among Reid's Qualities

Reid defines a primary quality as a quality whose corresponding untrained sensation causes a non-relative conception of and belief in that quality. Upon touching a hard surface, one naturally conceives of a body's parts firmly adhering. A secondary quality also prompts belief and conception via a sensation. But the conception is relative to the sensation it occasions. When one smells a rose, one conceives of the cause of the sensation as the cause of that sensation, not as tiny particles issuing from the rose.

One of the things that Reid hopes to clarify in making a distinction between primary qualities (e.g., extension, motion, hardness) and secondary qualities (e.g., sound, smell, taste) is the linguistic problem that arises when one applies a name to something one does not understand. Primary qualities generally have different names than the sensations they cause. In fact, the sensations often have no names at all. The sensation that conveys the notion of hardness to a perceiver as she touches the tabletop goes unnoticed. Instead, her mind focuses directly on hardness as a quality in the table.⁵ On the other hand, the sensations from a secondary quality do not automatically conjure conceptions of the quality's nature. One only forms a relative conception of the quality as the cause of the sensation. Thus, it is natural that in language, these sensations and their corresponding qualities bear the same names. Hence, "red" refers to both a quality of an apple and to the visual sensation it occasions in a human subject. Likewise, both the candy and its corresponding taste are "sweet."

Reid insists that if one were to push "the vulgar" to choose one or the other, they would insist that it is the candy that is really sweet rather than the sensation it causes.⁶ Likewise,

the smell of a rose is a quality of the rose rather than the sensation that it causes. And “C” specifies the frequency at which the musical instrument resonates rather than the sensation it causes in the ear. In every case, secondary qualities reside in bodies rather than in the mind

Human beings have come to understand secondary qualities better through scientific investigation. By Reid’s time, a great deal of progress had already been made toward uncovering the true natures of secondary qualities. Reid summarizes:

The nature of secondary qualities is a proper subject of philosophical disquisition; and in this philosophy has made some progress. It has been discovered, that the sensation of smell is occasioned by the effluvia of bodies; that of sound by their vibration. The disposition of bodies to reflect a particular kind of light occasions the sensation of color.⁷

Reid even suspects that temperature has something to do with the vibration of a thing’s parts, although he looks forward to the results of further investigations.⁸ Gaining such an understanding is not sufficient to remove the qualities from the secondary list. Learning about the natures of the qualities comes from experiments, induction, and testimony of scientists. The primary/secondary distinction depends on understandings derived from untrained sensations alone.

Reid describes the nature of color twice. First, in the *Inquiry* he explains:

Colour is not a sensation, but a secondary quality of bodies, in the sense that we have already explained; that it is a certain power or virtue in bodies, that in fair day-light exhibits to the eye an appearance, which is very familiar to us, although it hath no name.⁹

This is a relative description. It says nothing about what color is in itself, only what it causes and that it is in a body. In the *Essays*, on the other hand, he characterizes color as a disposition to “reflect a particular kind of light.” This is a direct description, a statement about what light is in itself, about its nature.

It is interesting that Reid describes color as the disposition of a body to reflect a kind of light rather than its actually reflecting light. But Reid’s treatment of “color” seems true to the English language. The candy is yellow when I unwrap it and expose it to the sunlight, and it remains yellow as I move it into the darkness of my mouth. It is also yellow before I unwrap it, even if the wrapper is completely opaque. Even if the candy were made in a completely dark factory, wrapped in foil, unwrapped in total darkness, and immediately eaten, it is still yellow because it is disposed to reflect a particular kind of light. “Color” has little to do with a thing’s actually reflecting light.

There is something unsettling about Reid’s account of color when compared to sound, smell, and temperature. Color is a disposition, but smell and sound are not, at least not dispositions to do anything but cause sensations. A rose without effluvia is a scentless rose. A still bell is soundless. Flavorless salt has no taste. A body with no kinetic energy among its parts is very cold indeed. But the rubies at the bottom of a mineshaft are still red, even if they *never* actually reflect light. Why, then, is this disposition a secondary quality but not the disposition of a bell to ring at such-and-such a pitch, a rose to emit such-and-such effluvia, or a body to have parts that move with such-and-such kinetic energy? All these things must *actually be happening* for a thing to have a sound, smell, or

temperature. A bell with a disposition to sound “C major” may not, in fact, be sounding. Something is amiss in this account of color. Its description should parallel the others much more closely.

Aristotle on Color

Aristotle makes some useful distinctions that illuminate the problems in Reid’s account. Here, I follow Katerina Ierodiakonou’s interpretation of Aristotle’s account of color, which leans heavily on Alexander of Aphrodisias.¹⁰ For Aristotle, color comes in four types: actual color, potential color, actually perceived color, and potentially perceived color. The first two are properties of a body; the latter are relational predicates.

Aristotle defines color as “the limit of the transparent in a determinately bounded body.”¹¹ That is, the color is the place where the clear stuff (i.e., the air, water, or vacuum) stops. So long as the limit of the transparent is not lit or, as Ierodiakonou puts it, “actualized by the fiery element,”¹² the color remains only potential (*dunamei*), a power. When the light hits the limit of the transparent, the potential color becomes actual (*energeia*),¹³ an activity. The “transparent at the surface of the body is actualized.”¹⁴ But color, in turn, excites the transparent. Aristotle explains:

Every colour has in it the power to set in movement what is actually transparent; that power constitutes its very nature. That is why it is not visible except with the help of light; it is only in light that the colour of a thing is seen.

Light is as it were the proper colour of what is transparent, and exists whenever the potentially transparent is excited to actuality by the influence of fire of something resembling “the uppermost body.”

At present what is obvious is that what is seen in light is always colour. That is why without the help of light colour remains invisible. Its being colour at all means precisely its having in it the power to set in movement what is already actually transparent, and, as we have seen, the actuality of what is transparent is just light.¹⁵

Thus, the light, being the actualized transparent, actualizes the color, which actualizes the transparent again. When light hits the color, the color reflects it.

Potential color is only potentially perceptible. Actual color, on the other hand, may be either actually or potentially perceived, depending, of course, on whether a subject sees the color. It is a Cambridge property insofar as the change from potentially to actually perceived is a change in a seeing subject rather than in the colored object itself. Potentially perceived color, though, requires no subject at all, according to Aristotle.¹⁶ This is an interesting claim, one that puts Aristotle at odds with those before him, but this controversy has little interest for the discussion here.

What is pertinent is Aristotle’s distinction between perceived color and the color itself, as well as between color as a potential or power and color as an actuality or activity. These are the notions that can explain the confusion on Reid’s account.

First, Reid's insistence that color is a quality of a body, distinct from any sensation the mind, corresponds to Aristotle's separation of color and perceived color. For Reid, a person perceives color when, upon having a sensation caused by the color, one conceives of and believes in the color. The conception and belief need not be overly complex or direct. At first, one will only think of color merely as the cause of the sensation. The color's being perceived is a mental process that occurs in the perceiver. A color's perception is a relational property for both Aristotle and Reid.

Reid puts color among the secondary qualities, which he characterizes as unknown causes of known sensations. But does the secondary quality refer to Aristotle's potential color or actual color? Clearly, potential color does not cause any sensations since it cannot be actually perceived. Only the actualized color interacts with a seer. Thus, it seems that if one were to merge Reid's scheme with Aristotle's, Reid's notion of color as a secondary quality would have to correspond to Aristotle's actualized color.

Now what of potential color, the power? Aristotle's potential color is the power to actualize the transparent if actualized by an already actualized transparent—that is, a disposition to reflect light or the power that has a disposition to reflect light. But this is just Reid's description of color, “the disposition of bodies to reflect a particular kind of light.”¹⁷ What Reid calls “color” in this passage is not an Aristotelian actualized color but a power.

Conveniently, Reid's conceptual world includes something like Aristotelian powers, which he calls “mechanical powers.”¹⁸ A Reidian power is an unknown cause, but not of a known sensation. Rather, it is the cause of a physical effect. Reid's list of powers includes inertia, cohesion, magnetism, and electricity¹⁹—relational notions Newton uses to mathematically describe physical events. Conceptually, Reid's notion of a power resembles that of a secondary quality. Both describe things relationally. However, secondary qualities relate to conceptions formed by sensations alone, whereas mechanical powers are relative to non-sensational physical events. Thus, a sound is a secondary quality because the sensation of sound provides one with only a relative understanding of what the sound is. The sound is whatever is causing this sensation. By contrast, inertia is a power because it is known only by its resistance to changes in motion. One requires no reference to sensations in describing it.

Aristotle's categories of power, activity, and perceived activity map nicely onto Reid's notions of power, secondary quality, and sensation. Reid's mechanical power is basically the same as an Aristotelian power. Not all Aristotelian activities would be secondary qualities, but it does seem that a body must be *doing* something in order to affect the senses. Finally, an Aristotelian perceived activity refers to an activity, whereas a Reidian sensation is a mental event. Still, an Aristotelian actually perceived activity becomes perceived by virtue of a sensation it causes in an observer. The two obtain together.

Thus, an Aristotelian alteration of Reid's account of color might go as follows: “Color” can refer to one of three things—a power, a secondary quality, or a sensation. The power of color is or has a disposition to reflect particular kinds of light. The secondary quality of color is the reflecting of particular kinds of light. The sensation of color is the mental event initiated by the reflection of particular kinds of light. I suspect that if one were to

put the question to English-speaking non-philosophers, they would say that “color” most naturally refers to the power rather than to the secondary quality or sensation.

This model works for other secondary qualities as well. The “sound of a tuning fork” could refer to the power the tuning fork has to vibrate at a particular frequency when struck, to its vibration upon being struck, or to the sensation caused by that vibration. The “smell of a rose” could be the power typical of roses to emit effluvia, its actually emitting effluvia, or the sensation occasioned by those effluvia. The equivocation with which Reid concerns himself in Chapter 6 of the *Inquiry*²⁰ is not only confusion between secondary qualities and sensations, but also involves mechanical powers.

The Proper Function Objection

The most forceful objection to my position here is likely to come from those who wish to take account of proper function in Redian and/or Aristotelian discussions of human sense organs. One might argue that I have failed to take into account the necessity of an appropriate environment for the proper function of sense organs. As Reid says in the *Inquiry*, color is something seen in fair daylight. One cannot hear a bell ringing in a vacuum, yet it does have the secondary quality of sound in virtue of its vibration. Likewise, one cannot see a red ball in the dark. A well-lit room is part of the environment required for the proper functioning of the eyes.

However, these cases are not parallel. The reason that one cannot hear the sound of the bell in a vacuum is that sound waves require a medium by which to transmit the vibration. Light, on the other hand, involves no medium, although it may be altered by a medium. A bell cannot be heard in a vacuum because human ears detect sound by means of vibrations through a medium. If one were to concoct an analogous situation with light, where inputs to the sense organs are distorted by a medium (or lack thereof), one might imagine trying to see while immersed in black ink.

Moreover, one cannot see a red ball in the dark because there is no light for the ball to reflect. Its power has not been activated. Perhaps this is a bit confusing because, as Aristotle explains, the thing that activates the color, light, is also the thing activated by it. In the case of the bell, the power of sound is activated by striking it. But I submit that these cases are analogous. A red ball in a dark room has no secondary quality of color just as a bell that has not been struck has no secondary quality of sound.

This response fits well with Reid’s account (and Aristotle’s). Reid not only insists that knowledge of the external world must come from properly functioning sense organs but also that those sense organs really do function properly. If one’s eyes really malfunctioned every time the sun went down or a bulb burned out, eyes would make for fairly unreliable sense organs. Perhaps one’s ears do not work well in a vacuum. But one is not likely to *be* in a vacuum either. On the other hand, normal human life involves, indeed requires, significant time in darkness. It seems counterproductive to Reid’s program to claim that darkness is an inappropriate environment for proper functioning of the eyes.

Conclusion

“Color” could refer to a Reidian mechanical power, secondary quality, or sensation. In the *Essays*, Reid attempts to describe the secondary quality of color as a disposition to reflect light. But, as the Aristotelian analysis shows, he actually characterizes the power of color. This does not render the Reidian scheme ineffective. Rather, one can make the pertinent Aristotelian distinctions in Reidian terms by correlating mechanical powers with Aristotelian powers, secondary qualities with activities, and sensations with perceivedness.

NOTES

1. I owe ideas for this paper, in part, to Matthew Douglass and to physicist Punit Ghandi.
2. Thomas Reid, *An Inquiry into the Human Mind on the Principles of Common Sense*, ed. Derek Brooks (University Park, PA: The Pennsylvania State UP, 1997) (hereafter, IHM), 5.1, 54; 5.8, 73; 6.4, 86; Thomas Reid, *Essays on the Intellectual Powers of Man*, (Edinburgh, 1785), *Eighteenth Century Collections Online* (hereafter EIP) 2.3, 93; 2.17, 241; 2.18, 255.
3. IHM 2.1, 55; EIP 2.17, 239.
4. IHM.
5. See IHM 5.3, 58-61, on sensations as natural signs for qualities of bodies.
6. IHM 2.8, 39.
7. EIP 2.17, 239.
8. IHM, 2.1, 55.
9. IHM, 6.5, 87.
10. Katerina Ierodiakonou, “Aristotle on Colours,” *Aristotle and Contemporary Science Vol. II*, Eds. Demetra Sfendoni-Mentzou, Jagdish, Hattiangadi, and David M. Johnson. (New York: Peter Lang, 2001) 211-225.
11. Aristotle, *On Sense and the Sensible* 439b11-12; Beare translation.
12. Ierodiakonou 213. This notion is likely broader than merely being in the presence of light. In *On the Soul* 2.7, Aristotle puts it this way: “Light is as it were the proper colour of what is transparent, and exists whenever the potentially transparent is excited to actuality by the influence of fire of something resembling ‘the uppermost body’”; Smith translation.
13. Ierodiakonou 214 notes that unqualified references to color in both Aristotle and Alexander seem to indicate actual color rather than potential. For Aristotle, it is natural to say that when the lights are off, things are not colored.
14. Ierodiakonou 214.
15. Aristotle, *On the Soul* 2.7.
16. See Ierodiakonou 215.
17. See above.

18. EIP 2.18, 248; 2.18, 253.

19. EIP 254-55.

20. IHM 6.4, 85-95, esp. 92-93.