Explaining Locke's Primary and Secondary Qualities

In his *Essay Concerning Human Understanding*[1], John Locke makes a distinction between the primary and secondary qualities of objects. For Locke, primary qualities (PQ's) are those accidents (or properties) of objects that inhere in the objects themselves in whatever state they are. He claims, problematically, they are "utterly inseparable from the body,"[2] both physically and conceivably. To clarify: changing a primary quality means changing the object itself. Secondary qualities (SQ's) are those accidents whose existence depends on both (a) an object's primary qualities and (b) a perceiving agent's perception of the SQ. Therefore, they do not themselves inhere in objects; rather, SQ's are powers inhering in objects which produce ideas of the SQ's in us. Changing a SQ does not change the object itself. Locke's purpose in making this distinction is to refute the Medieval Aristotelian theory that all qualities equally inhere in their respective objects. My design is to explain this distinction and Locke's arguments in support of it, and then consider the problematic case of solidity as a primary quality.

I. Defining the Distinction

Locke names the following as a complete list of PQ's[3]: solidity, extension (i.e. bulk, or size), figure (i.e. shape), number, situation (i.e. spatial location) and motion (or rest). An incomplete list of SQ's includes: colors, sounds, smells, tastes, feels, etc. And powers of objects to produce change in other objects he also considers SQ's.

We must first consider what it is for PQ's to be "in the objects themselves,"[4] as Locke claims they are. What Locke means by this is that a quality must be so much a part of its object that the object cannot be physically separated from, or even conceived of without, the quality. He gives the example of a grain of wheat: no matter what one might do to break it or alter it, the grain (or each new piece) still has the property of having shape, size, number, a spatial location, etc. These qualities are so intimately connected with the grain as to actually be required by the grain's existence.

Note that the manifestations of particular PQ's may change. The grain may have been split in two; it may have fallen on the floor, or been set into motion at some point. But at no point in changing the manifestations of the PQ's were the grain pieces separated from *having* PQ's. This is what Locke means by "in the objects themselves."

Locke also explains how PQ's produce ideas of themselves in us. He holds that bodies can only produce ideas in us by impulse—that is, they send out imperceptible bodies which are received by the concerned senses. The senses transmit this motion to the brain, which produces ideas in us of the PQ's. He further maintains that those ideas *resemble* the PQ's perceived by our senses because PQ's exist in objects whether perceived or not.

Locke's claim that PQ's are inseparable from their objects creates a problem, though, upon considering Descartes' heated piece of wax.[5] As I touch the pliable wax, its shape is altered by the pressure of my fingers. This is clearly a case of changing its PQ's, but we would not say that it is no longer a piece of wax. Non-rigid states of matter (e.g.: liquids, gases, and even pliable solids) have either no distinct shape or a constantly

changing one. Locke might respond to such an objection by making an *ad hoc* exception for these cases' not needing shape, or he might modify his theory in the following way.

Locke may want to say here that PQ's can be determined in ranges, rather than absolutes. For example, every snowflake has a unique shape; yet we wouldn't say that there is only one snowflake shape. Or consider that I change the shape of a piece of paper by folding it. We wouldn't say that it is a new object, but rather that it is the same object with a different shape. But if we modify Locke's theory to include a natural range of possible shapes (or, more extensively, PQ alterations), it seems to better fit the way we understand objects.

Nonetheless, let us consider his SQ's. SQ's are not in the objects themselves. This is obvious from their partial dependence on being perceived. Rather, SQ's are powers inherent in objects and are conveyed by means of the PQ's. The color blue is just an object's power in virtue of its PQ's to produce an idea of blue in a perceiver. Note that this also depends on the perceiver's ability to see the color blue, so blue cannot be in objects themselves. SQ's are just powers of objects to produce certain ideas in us.

Locke further claims that SQ's work on us by the motion of insensible particles to our senses, and that God connects the ideas of SQ's to the particles so that we may perceive them correctly. This differs from the way we perceive ideas of PQ's. PQ ideas resemble their PQ's and need no divine connection. SQ ideas do not resemble their powers, but rather are *caused by* the powers. For example, the idea of a sound bears no resemblance to a power to make air vibrate, etc. Whereas PQ ideas have a resemblance relationship with their originals, SQ ideas have a causal relationship with their powers.

II. Analysis of Arguments Supporting the Distinction

Locke makes the following four arguments that support, with varying degrees of success, his distinction between PQ's and SQ's. His first two arguments seem to lead to problematic conclusions, but his second two arguments support his distinction more strongly.

The first of these is the Pain Argument[6]. Heat being an example of a secondary quality (feel), the argument goes like this:

P. At a distance from a fire we perceive heat.
P. Up close to a fire we perceive pain.
P. Pain is obviously not in the fire.
C. So heat is not in the fire either.

This argument is dubious in that it assumes that pain is an intense form of heat, which is not a sound assumption. Pain has the special property of not existing unfelt, whereas heat does not. Suppose there is a forest fire in an uninhabited part of Montana. Of course no one would feel any pain from it—but it doesn't seem right to claim that the fire isn't hot just because there are no people around. This argument doesn't provide much support for Locke's distinction.

Second is the Colors Argument[7], which looks like this:

P. With the lights on, we perceive a piece of porphyry to be red and white.
P. With the lights off, we perceive the same object to be without color.
C. So color itself cannot inhere in an object.

Our perception of the porphyry has changed without making any real changes to the porphyry itself. This argument can be dispensed with simply by putting a qualification on SQ's: enabling conditions.

Enabling conditions are necessary conditions external to an object and a perceiver that, only upon the fulfillment of which, allow a particular power to work. In this case,

the enabling condition for 'red and white' to be produced is a certain minimum level of light. In the case of a sound, the enabling conditions are that the object must be outside of a vacuum, etc. Granted this corollary, the Colors Argument loses its validity.

Locke's third argument suggests that the reader crush an almond[8]. The almond pieces still retain all the PQ's (solidity, extension, figure, etc.), but their SQ's have changed. The sweet taste has been lost and replaced by an oily taste, and similarly the white color has been replaced by a dirty color. From this we can gather that some qualities are part and parcel of their objects, while others are mutable. This, therefore, is Locke's first substantial justification of his distinction.

The fourth argument is the experiment in which one puts both a cold hand and a hot hand into the same lukewarm water.[9] Each hand perceives a level of heat in the water contrary to that of the other hand. This argument is similar to the third, but stronger in that no changes are made to the object in question. Thus one is able to perceive simultaneously different SQ's from an object whose PQ's remain constant. Without a distinction between PQ's and SQ's, it should not be possible for some qualities to be perceived in contrary ways. This experiment shows that the Medieval Aristotelian theory is inconsistent, and provides further grounds for Locke's distinction.

III. The Problem of Solidity

The 'problem' to which the heading of this section refers is Locke's placement of solidity in the category of PQ's. Solidity seems to exhibit signs of being a SQ, e.g.: melting an object changes its solidity without necessarily changing the object itself. Ice

melts into water above 0°C, and water manifests different primary qualities than ice. This suggests that solidity, which is changeable, is not clearly a true PQ.

But solidity doesn't fit nicely as a SQ either. SQ's are powers dependent on both an object's PQ's and on a person's ability to perceive SQ's. It might make sense to say that solidity is a power of an object to produce ideas of degrees of solidity in us; however, we would then be forced to say that the solidity of an object also depends upon its being perceived. Like the forest fire example, this produces a very strange result.

Locke has two options for solving this problem. If he considers that a melted object is the same object as the original, even though its properties have changed, then solidity is a SQ. If solidity is a PQ, he would have to claim that an ice cube and, later, a melted puddle of water are the same object. He obviously chooses the first one, and that seems to be his best choice. We would naturally be more inclined to say that water and ice are the same object, messy as that may be, than to say that an object's solidity depends on its being perceived. Although this result is clearly not the definitive answer to the problem, it is consistent with Locke's theory and seems to be the lesser of two evils.

Thus, Locke's distinction carries some theoretical weight. It is by no means perfect, especially given the problems of inseparability and solidity, and it is still subject to criticism from a different angle by immaterialists like Berkeley. Nonetheless, the distinction has some good insights into how we understand the qualities of substances, and on that merit earns its place in his *Essay*.

NOTES

[1] Locke, John. *An Essay Concerning Human Understanding*. Ariew, Roger and Watkins, Eric: Modern Philosophy: An Anthology of Primary Sources, ©1998 Hackett Publishing Company. pp.286-290. [NOTE: All citations here, save one, refer to this work, so only page numbers are referenced.]
[2] p.286, § 9
[3] p.289, § 23
[4] p.286, § 9-10
[5] Descartes, René. "Meditation Two" from *Meditations on First Philosophy*. Ariew, Roger and Watkins, Eric: Modern Philosophy: An Anthology of Primary Sources, ©1998 Hackett Publishing Company. pp.32-34.
[6] p.287-288, § 16-18
[7] p.288, § 19
[8] p.288, § 20
[9] p.288-289, § 21