

## Locke's Distinctions Between Primary and Secondary Qualities

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Is there a distinction between primary and secondary qualities? The question may rest on a confusion. It is not obvious that it would be raised if the questioner knew what he meant by 'primary' and 'secondary' qualities.

There is at least this distinction. We may distinguish between the basic explanatory features of things and the derivative features they explain. In the disciplines that gave rise to chemistry, there's a long tradition of calling the fundamental explanatory qualities or principles 'firsts' (Maier 1968: 17-18, Anstey 2000: 20-30). Aristotle's 'first qualities' are hot, cold, dry, and wet; Paracelsus's *tria prima* ('three firsts') are salt, sulphur, and mercury. Boyle was willing to follow Aristotelian usage in calling hot, cold, dry, and wet 'first qualities'; he called what he considered to be the more fundamental attributes of size, shape, motion, and rest "*Primary Modes* of the parts of Matter, since from these simple Attributes or Primordially Affections all the Qualities are deriv'd" (Boyle [1670] 1999: 6.267).

If Locke were only interested in advocating mechanistic physics, his discussion of primary and secondary qualities would be of marginal interest. Long before the publication of *An Essay Concerning Human Understanding*, Boyle offers a defense of the thesis that "almost all sorts of Qualities . . . *may* be produced Mechanically—I mean by such Corporeall Agents as do not appear, either to Work otherwise than by vertue of the Motion, Size, Figure, and Contrivance of their own Parts" (Boyle [1666] 1999: 5.302) which is clearer and more developed than Locke's defense. The account in the *Essay* remains worth careful study

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because Locke fits the corpuscularianism with an epistemology, a philosophy of mind, a semantics, and a metaphysics.

His use of the expression ‘I call’ in E II.viii.9 suggests that Locke officially defines primary qualities as “such as are utterly inseparable from the Body.” This definition of doesn’t seem entirely apt for his purposes. Richard Aaron (1971: 126, cf. Jackson 1929: 63-66, Mackie 1976: 20-21) observes that that when Locke “first introduces primary qualities in II.viii.9 he seems to be thinking of them as *determinates*, if I may use W. E. Johnson’s terminology, but as *determinables*, not as particular shapes, for instance, but as shape in general.” Determinate figures such as Locke’s examples “Circle or Square” (E II.viii.18: 138) don’t count as primary by his official definition unless we tacitly assume that qualities also count as primary if they are determinations of inseparable determinable qualities. Moreover, motion seems to be an intelligible, explanatory yet separable quality by his lights. Locke can only get it to count as inseparable by putting it under the gerrymandered determinable quality *motion or rest* (R. Wilson 2002: 223).<sup>2</sup> If that gerrymandered quality is legitimate, then so are *transparent or colored* and *tasty or insipid*. Even so, the definition and the example that he uses to motivate it help to justify his theses that primary qualities are amenable to rational inference and that they are not powers to produce ideas in us.

Locke’s use of the expression ‘I call’ in E II.viii.10 suggests that he officially defines secondary qualities as “Powers to produce various Sensations in us”. The wider philosophical community calls this the Lockean account of secondary qualities, and I myself agree that we should accept this definition as definitive. There are, however, at least two weighty reasons for hesitating.

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<sup>2</sup> Anstey (2000: 46) observes that Boyle “wavers” on the inseparability of motion (1999: 5.307).

The first is that it seems indistinguishable from what seems to be his official definition of quality: “the Power to produce any *Idea* in our mind, I call *Quality* of the Subject wherein that power is.” (E II.viii.8: 386). Locke offers, by way of illustration, “a Snow-ball having the power to produce in us the *Ideas* of *White*, *Cold*, and *Round*, the Powers to produce those *Ideas* in us, as they are in the Snow-Ball, I call *Qualities*” (ibid.) Assuming that not all qualities are secondary qualities, commentators have some explaining to do. The problem splits scholars who take his definition of qualities as powers to produce ideas in us seriously (Curley 1972: §3, Campbell 1980: 568-70, Alexander 1985: 165) from those who treat it as a mere slip (Jackson 1929: 71, Maier 1968: 65, Cummins 1975: 408-10, Mackie 1976: 11-12, Stuart 2003: 70). I am more sympathetic to the second group, but, in the spirit of compromise, I’ll later describe two Lockean senses of power. In one of these senses, secondary qualities are powers; in the other, primary qualities are.

Here’s a second reason for doubting that Locke genuinely intends to define secondary qualities as powers to produce sensations in us. Locke gives various examples of secondary qualities, including three in the passage where he seems to define them: “Colours, Sounds, Tasts, *etc.*” (E II.viii.10). And, while these examples are never offered as if they are exhaustive, one might doubt that there is any principled difference to be drawn between the power to produce the idea of red and the power to produce the idea of oblong. Why should our ideas of color pick out mere powers to produce ideas in us, while our ideas of shape pick out intrinsic, mind-independent qualities?

To answer this question is to unpack the argument of *Essay* II.viii. From an argument for a physical hypothesis, Locke draws conclusions about how our ideas represent. From that physical hypothesis and his theory of representation, he draws metaphysical conclusions about primary and secondary qualities. Because Locke believes that primary

qualities are explanatory and secondary qualities not, he concludes that our ideas of primary qualities resemble and our ideas of secondary qualities do not. Because our ideas of primary qualities resemble and our ideas of secondary qualities do not, he concludes that our ideas of primary qualities represent intrinsic, mind-independent, real qualities and that our ideas of secondary qualities represent powers to produce ideas in us

Locke draws more than one distinction here; he wants to convince his reader that they overlap. If we oversimplify and try to boil his theses down to one essential distinction, his discussion loses part of its depth. The distinctions are:

- 1. Primary qualities are explanatory; secondary qualities are not deeply explanatory.**
- 2. Ideas of primary qualities resemble something in bodies; ideas of secondary qualities do not.**
- 3. Primary qualities are not dispositions; secondary qualities are dispositions to produce ideas in us.**
- 4. The genera of primary qualities are inseparable from bodies; the genera of secondary qualities are separable.**
- 5. Primary qualities belong to bodies as they are in themselves; secondary qualities do not.**
- 6. Primary qualities, with the possible exception of some sorts of velocity, are real beings; secondary qualities are not.**

Let me explain these six contrasts in some more detail.

### **First Distinction, Part I: Primary Qualities are Explanatory**

Defending corpuscularianism is not the primary business of Locke's *Essay*, but it still contains arguments that a body “performs its Operations” through “the Mechanical affections” (E IV.iii.25: 556) of its microphysical parts. In particular, Locke argues that “Powers to produce various Sensations in us” work “by their *primary Qualities*, *i.e.* by the Bulk, Figure, Texture, and Motion of their insensible parts” (E II.viii.10: 135, cf. §§23, 26).

In §§11-14 of Book II, Chapter viii, Locke defends a corpuscularian theory of perception as follows. Bodies affect our sense organs through impulse, since alternative forms of corporeal interaction are inconceivable. When we perceive bodies at a distance, they affect our senses. Thus, there must be intermediate bodies between us and the perceived bodies. These intermediate bodies are imperceptible and so, presumably, too small to be perceived (McCann 1994: 62). To those who object that his explanation is vitiated by its postulation of an inconceivable, divinely instituted connection between motions in our sense organs and ideas of color and smell in our minds, Locke replies that it is “no more impossible, to conceive, that God should annex such *Ideas* to such Motions, with which they have no similitude; than that he should annex the *Idea* of Pain to the motion of a piece of Steel dividing our Flesh, with which that *Idea* hath no resemblance” (E II.viii.13: 136-37. Locke borrows this violent analogy from Descartes (AT 8a.321 CSM 1.284, Maier 1968: 49-50, 66).

In E II.viii.21, after this initial defense of a corpuscularian theory of perception, Locke argues that it allows us “to give an Account, how the same Water, at the same time, may produce the *Idea* of Cold by one Hand, and of Heat by the other,” when we’ve heated one hand and cooled the other. On the hypothesis that “the Sensation of Heat and Cold, be nothing but the increase or diminution of the motion of the minute Parts of our Bodies”<sup>3</sup>—that is, if sensations are determined by a change in the velocity in the particles in our nerves—then the phenomenon “is easie to be understood” (cf. W III: 328). The hypothesis is hinted at by Bacon ([1620] 2000: 126, 131), asserted by Descartes (AT 4.237 [1637] 2001: 266; AT 1.424 CSMK 3.66), and developed at length by Boyle ([1673] 1999: 7.345-46, 350-

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<sup>3</sup> At the end of this sentence, Locke gives what I think is his considered view: the sensations of heat and cold “depend” on increases and decreases of motion.

54, Woolhouse 1983: 150-52). When one hand is heated and the second cooled, plunging both hands into the same water will speed up the particles in one hand and slow down the particles in the other. Edwin Curley (1972: 458) and J. L. Mackie (1976: 22-23) construe this straightforwardly as an argument to the best explanation for a piece of corpuscularianism.

In illustrating inference by analogy, Locke offers another defense of a corpuscularian account of heat, this one concerned with heat insofar as it is a mind-independent phenomenon. He writes, “observing that the bare rubbing of two Bodies violently one upon another, produces heat, and very often fire it self, we have reason to think, that what we call Heat and Fire, consists in a violent agitation of the imperceptible minute parts of the burning matter” (E IV.xvi.12: 665-66). The analogy is between heat and fire that are obviously caused by motion and heat and fire with an unknown cause. Tendentiously, Locke moves from the premise that rubbing macroscopic bodies *produces* heat and fire in some cases to the conclusion that heat and fire *consist* in the violent motion of imperceptible parts.

Often, Locke’s analogies illustrate and justify his belief that microphysical primary qualities explain the biological and chemical capacities of bodies. Death is like the stopping of a clock through the filing of a gear; sleep is like the stopping of a clock through placing a piece of paper on the balance, dissolving a metal with an acid is like opening a lock with a key (E IV.iii.25: 556), the internal structure of a human being is like the internal structure of the clock at Strasbourg (E III.vi.3: 440, Woolhouse 1983: 99-103, cf. Laudan 1966). Generally speaking, Locke thinks that mechanical explanations work for artifacts. He insinuates that similar explanations would work in the natural world, if we could perceive the real essences of natural objects.

As we have seen, according to Locke, secondary qualities depend on primary qualities. Let me defer the question of whether he thinks that secondary qualities are explanatory at all until I have more pieces of his metaphysics on the table.

### **Second Distinction, Part I: Ideas of Primary Qualities Resemble Something in Bodies**

Locke feels the need to explain his digression into “Physical Enquiries,” in a book devoted to the study of human understanding (E II.viii.22: 140). He makes this detour partly to establish something about the relation between our ideas and the external world, a central topic of Book II of the *Essay* (Maier 1968: 64, Bolton 1983: 359). After advancing his account of perception, he writes,

“From whence I think it is easie to draw this Observation, That the *Ideas of primary Qualities* of Bodies, are *Resemblances* of them, and their Patterns do really exist in the Bodies themselves; but the *Ideas, produced* in us *by* these *Secondary Qualities*, have no resemblance of them at all (E II.viii.15: 137).

St. Thomas, a target here, had written, “colors are on a wall, the resemblances [*similitudines*] of which are in the sight” (ST 1a 76 A1, Cohen 1982); Descartes, an ally here, classified his previous beliefs that there is something in bodies “exactly resembling” our ideas of heat, colors, tastes among his “ill-considered judgements” (AT 7.82 CSM 2.56-57, M. Wilson 1994)

Today, some commentators think it is so obvious that ideas cannot resemble bodies that they insist on reinterpreting philosophers who write that some ideas do. Jonathan Bennett (1982) states this position with special vigor. For Locke, they have argued, an idea resembles a quality in the corresponding thing just in case the scholastic theory of perception applies to that idea (Woolhouse 1983: 159-61, Heyd 1994, McCann 1994: 63-64), or if the quality helps to explain the production of the idea (Bennett 1971: 106, Curley 1972: §5, Cummins 1975: 402-05), or if the thing has the quality that the idea represents it as having

(Woozley 1964: 32-35), or if just one fine structure corresponds to the simple idea (Campbell 1980: 582). In my opinion (Jacovides 1999: §2.1), these readings either stretch the meaning of ‘resemblance’ too far or don’t completely fit Locke’s text (but cf. Hill 2004).

I think, following Thomas Reid ([1764] 1877: 1.131), Hilary Putnam (1981: 57-58), Michael Ayers (1991: 1.63-65), and Kenneth Winkler (1992: 154-56), that the best reading of Locke’s theses takes them literally. However few philosophers today think that ideas can resemble bodies, in the 17<sup>th</sup> century, the doctrine was commonplace. More specifically, it was a common doctrine that sense production caused a corporeal image somewhere in the head (Descartes AT 6.109-37[ 1637] 2001: 87-105; Willis [1661-64] 1980: 139). Though Locke is agnostic about the relation between matter and ideas (E I.i.2: 43-44, Locke 1971), this background shows that we can’t just dismiss a literal reading as uncharitable. Moreover, other texts support a literal reading (E II.viii.18: 138, E II.ix.8: 145, E II.xvi.1: 205, E IV.iv.6: 565).

Whatever Locke means by ‘resemblance,’ the relation is one of the two ways that he believes that ideas can represent external objects. The other way is by brute causal connection. According to Locke, since the mind can’t make simple ideas on its own, they “must necessarily be the product of Things operating on the Mind in a natural way, and producing therein those Perceptions which by the Wisdom and Will of our Make they are ordained and adapted to” (E IV.iv.4: 563-64). In Ayers’s apt phrase (1991: 1.62), some of our simple ideas are mere ‘blank effects’ of their causes. Though they do represent the outside world by signaling various features of it, the connection isn’t intelligible: they “can, by us, be no way deduced from bodily Causes, nor any correspondence or connexion be found between them and those primary Qualities which (Experience shews us) produce

them in us” (E IV.iii.28: 559, cf. E IV.iii.13: 545, McCann 1994: 69-72). Thus, they don’t give any insight into the nature of the causes.

According to Locke, resemblance allows us to represent external objects in a way that preserves the truth of theorems: “Is it true of the *idea* of a *Triangle*, that its three Angles are equal to two right ones? It is true also of a *Triangle*, wherever it really exists” (E IV.iv.6: 565). Not only does this give him a second mechanism for mental representation, but resemblance gives the possibility of something more than the mere awareness of the presence of some external quality; resembling ideas give the possibility of an intelligible grasp of the workings of external objects (Downing 1998: 388-89n15).

Once we realize that Locke believes that only resembling ideas can underwrite an accurate, explanatory physical theory, we can understand his inference from his corpuscularian theory of causation to his resemblance theses in §15. Consider first the reasoning behind the positive resemblance thesis. Assume that Locke’s argument for a corpuscularian theory perception succeeds and yields a right and intelligible account of the external world. If we can only have right and intelligible theories on the condition that our ideas of the explanatory qualities of that theory resemble those qualities, then it follows that our ideas of the explanatory qualities of corpuscularianism (that is, our ideas of primary qualities) resemble those qualities (Alexander 1985: 195-96).

### **Second Distinction, Part II: Ideas of Secondary Qualities Don’t Resemble Anything in Bodies**

Because Locke believes that ideas are the immediate object of the understanding (E II.viii.8: 134) and because he worries whether and how our ideas represent external objects, he believes that there ought to be a presumption against thinking that our ideas resemble external things. He defends this presumption in the three sections immediately following his statement of his resemblance theses. In what follows, I’ll take Locke’s talk of ‘ideas being in

things' to be another way of saying that the idea resembles something in the object. The fits the texts, his marginal summary of the passages including §§16-18, and has Locke defending a position that is, by his lights, substantial, controversial, and true.

In all three sections, he compares ideas of secondary qualities to pain (Atherton 1992: 118, McCann 1994: 65-66). He borrows Descartes's thought experiment of walking closer and closer to a fire (AT 7.83 CSM 2.57, Maier 1968: 49, 66) to show that the idea of warmth is as likely to resemble external objects as the idea of pain.<sup>4</sup> According to Locke, this similarity establishes a presumption that ideas of warmth and ideas of pain stand in the same relation to the outside world. Someone considering such a fire, "ought to bethink himself, what Reason he has to say, That his *Idea of Warmth*, which was produced in him by the Fire, is actually *in the Fire*; and his *Idea of Pain*, which the same Fire produced in him the same way, is *not* in the *Fire*" (E II.viii.16: 137). There's no such reason, Locke believes, and without some such, we ought to say that neither our idea of warmth nor our idea of pain resemble something in the fire.

He next compares the ideas of whiteness and cold that snow produces with the pain it can also produce (E II.viii.16: 137), and the ideas of whiteness and sweetness with the pain and sickness that a laxative produces (E II.viii.18: 138), both times challenging his opponent to give "some Reason to explain" (ibid.) the difference between the two cases that justifies thinking that ideas of secondary qualities, but not ideas of pain, resemble something in bodies (Rickless 1997: 311-12).

So Locke has a presumption against believing that ideas resemble something in bodies. He thinks that ideas of primary qualities can overcome that presumption, by being elements of the theory that explains the workings of bodies most intelligibly, and that the

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<sup>4</sup> Locke offers a teleological explanation of the phenomenon at E II.vii.4.

only way that a theory could intelligibly explain the workings of bodies is if our ideas resemble the explanatory qualities in that theory. No similar argument is available to overcome the presumption that ideas of secondary qualities do not resemble anything in bodies, so Locke concludes that they don't.

Consider in this light Locke's diagnosis of why people mistakenly think that the causes of our ideas of secondary qualities resemble those ideas. When we see the sun burn a fair face or whiten a lump of wax "we cannot imagine, that to be the Reception or Resemblance of any thing in the Sun, because we find not those different Colours in the Sun it self" (E II.viii.25: 142, cf. Palmer 1974: 44-45). In contrast, "our Senses, not being able to discover any unlikeness between the *Idea* produced in us, and the Quality of the Object producing it, we are apt to imagine that our *Ideas* are resemblances of something in the Objects" (ibid.). We can't compare our ideas of things and the things themselves, since the ideas get in the way (Palmer 1974: 46). Locke's diagnosis, like his main argument, requires a veil of ideas to generate the presumption that our ideas don't resemble external objects.

Another argument for the conclusion that ideas of secondary qualities don't resemble anything in bodies is worth mentioning. When Locke presents the example of water seeming hot and cold in his Second Reply to Stillingfleet, there's no mention of corpuscularianism, just an argument that it's impossible for ideas of hot and cold to be "the likenesses and the very resemblances of something in the same water, since the same water could not be capable of having at the same time such real contrarities" (W IV: 399). If, as Aristotle said (GC 329b19), hot and cold are contraries, then they can't both be in the water (Heyd 1994: 27). If we further assume that each hand has been stressed equally by unusual temperatures, there's no reason to think that the idea produced by one and only one hand resembles something in the water (Bolton 1983: 365-66, Rickless 1997: 317-18). Still, this

point can't be directly generalized to cases where our sense organs aren't distressed (Aaron 1971: 120), and Locke doesn't explicitly make that generalization either at E II.viii.21 or in the Stillingfleet correspondence.

### **Third Distinction, Part I: Secondary Qualities are Dispositions to Produce Ideas in Us**

Locke defines 'secondary qualities' as "Such *Qualities*, which in truth are nothing in the Objects themselves, but Powers to produce various Sensations in us by their *primary Qualities*" (E II.viii.10: 135). He defines 'quality' as "the Power to produce any *Idea* in our mind" (E II.viii.8: 134). Which of these definitions should we take more seriously? What was Locke thinking when he offered these strangely overlapping definitions? Why does he believe that secondary qualities are nothing but powers to produce ideas in us?

With respect to the first question, there are at least three reasons to take the definition of secondary qualities more seriously. First, only it is supported by other texts. If the definitions in §§8 and 10 were both deleted, we would have no idea that Locke ever considered primary qualities to be powers, but we would have plenty of texts where he declares secondary qualities to be powers (e.g. E II.xxiii.8: 300, E II.xxxi.2: 374-75), including passages in Book II, Chapter viii where he is contrasting secondary qualities with primary ones (e.g. §§15, 22-23, 26; Stuart 2003: 70). Second, Locke denies that primary qualities are powers by writing, "the simple *Ideas* whereof we make our complex ones of Substances, are all of them (bating only the figure and Bulk of some sorts) Powers" (E. II.xxxi.8: 381, Stuart 2003:70--'bating' means 'with the exception of.').<sup>5</sup> Third, as I'll show, we can easily reconstruct a sound argument against the thesis that primary qualities are

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<sup>5</sup> According to Alexander (1985: 166), Locke's point here is only that some sorts of substances don't include shapes in their abstract ideas. The passage makes clear that he thinks that shapes are in our ideas of some sorts and not in others, but what Locke asserts is that all of the ideas in our abstract ideas of substantial sorts are powers except for our ideas of figure and bulk (Stuart 2003: 94-95n24).

powers to produce ideas in us from materials that Locke provides us. Sound arguments for interesting conclusions are so rare in philosophy that I would hate to think that he stumbled across one without realizing it.

Even though Locke's definition of quality as a power to produce ideas doesn't cohere with the rest of the *Essay*, I think that something can be said about why he offered it. He uses the word 'power' in two different ways (Leibniz [1765] 1981: 216, Jacovides 2003: 332-33).<sup>6</sup> His usual sense of 'power' is deflationary. On this account, powers are merely capacities to do things and not explanatory entities. We might call these bare powers (cf. E II.viii.25) or dispositions. To say that a bare power such as 'the *digestive* Faculty' answers the question "what it was that digested the Meat in our Stomachs . . . is, in short to say, That the ability to digest, digested" (E II.xxi.20: 243-44). A different, explanatory notion of power shows up at E II.xxii.11. Locke there asserts, "*Power* being the Source from whence all Action proceeds, the Substances wherein these Powers are, when they exert this Power into Act, are called *Causes*." We might call these robust powers.

When Locke characterizes qualities as powers to produce ideas in us, he is mixing bare powers and robust powers (Bolton 2001: 111). Primary qualities are powers in the sense that they are responsible for producing the relevant ideas. A body produces sensations "*by Reason of its insensible primary Qualities*" (E II.viii.23: 140). Secondary qualities are powers in the sense that having a secondary quality entirely consists in being able to produce a certain idea in perceivers. Such powers don't give a serious explanation of the corresponding actuality.

Locke's occasional suggestions that he uses the word 'quality' loosely need to be understood in light of its traditional status in the table of categories. He tells us that features

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<sup>6</sup> Three, if you count the normative sense of 'power' in E II.xxviii.3 and in T §3.

that enter the mind through more than one sense, such as “Extension, Number, Motion, Pleasure, and Pain” aren’t classed as qualities “in its ordinary acception” (E III.iv.16: 428). His point is they were traditionally classed as quantities, actions, and passions. Rickless (1997: 302) argues that the problem with the excluded features is that they aren’t powers, but that wasn’t the ordinary usage of ‘quality.’ According to Locke, powers to affect bodies have as much right to be called qualities as secondary qualities (E II.viii.10: 135). His point is that a scrupulous metaphysician might class them both as relatives (cf. Jackson 1929: 61-62).

Locke’s clearest exposition the hybrid nature of his conception of qualities comes in a memorandum at the end of Draft A of the *Essay*. He first stipulates that when he speaks of ideas existing out in the world he means what is “the cause of that perception. & is supposed to be resembled by it.” Of such a cause, he tells us, “this also I call quality. whereby I meane anything existing without us which affecting any of our senses produces any simple Idea in us” (Draft A 95: D I 82-83). These qualities are supposed to be resemblances, and they affect our senses, so we may think of this passage as an early description of primary qualities.

Locke goes on to define ‘quality’ in its application to what we may recognize as secondary and tertiary qualities:<sup>7</sup> “because the powers or capacitys of things which too are all conversant about simple Ideas, are considerd in the nature of the thing & make up a part of that complex Idea we have of them therefor I call those also qualities” (Draft A 95: D I 83). Powers or capacities are counted as qualities because people think that they are parts of the natures of things and because the corresponding ideas are constituents of our complex ideas.

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<sup>7</sup> ‘Tertiary quality’ is what commentators call Locke’s “third sort” of quality (E II.viii.10: 135), which he describes as “The *Power* that is in any body, *by Reason* of the particular Constitution of *its primary Qualities*, to make such a *change* in the *Bulk, Figure, Texture, and Motion* of another Body, as to make it operate on our Senses, differently from what it did before” (E II.viii.23: 140).

By saying that he “also” calls powers ‘qualities,’ Locke implicitly contrasts powers with the first sort of qualities.

He then somewhat artificially distinguishes between primary and secondary qualities on the one hand, and what his commentators will call tertiary qualities:

distinguish qualities into actual & potential v:g: all the actual qualities in salt are those which any way affect our senses being duly applied to them & soe cause simple Ideas in us as its tast colour smell & tangible qualities. the potential qualities in it are all the alteration it can of its actual qualities receive from any thing else, or all the alteration it can make in other things v:g solution in water, fusion in a strong fire corrosion of Iron &c. (ibid.)

Powers that would affect our senses if duly applied count as actual qualities, here. To be a potential quality, judging by his examples, isn’t enough to be a capacity: it has to be a non-sensory capacity that hasn’t been activated.

Martha Brandt Bolton describes Locke’s contrast between ‘actual’ and ‘potential qualities’ and rightly concludes, “This is surely not the doctrine of primary and secondary qualities” (1976b, 308). Jonathan Walmsley quotes Locke’s proto-description of primary qualities and writes, “Locke put all the attributes of bodies and the respective ideas they caused in us on an equal footing” (2004: 31). Indeed, the passages they quote don’t draw the distinction between primary and secondary qualities, but nearby lines in the memorandum do draw a distinction between the causes of our ideas and mere powers or capacities.

In Draft A the purportedly resembling causes of our ideas, what he came to call primary qualities, are not called powers.<sup>8</sup> This two-part definition is revised into a glib

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<sup>8</sup> In correspondence, Walmsley emphasizes that the resemblance is merely supposed and that in the corresponding passage in Draft B (178: D I 164), the resemblance is “vulgarly supposed.” Let me suggest that the difference between the Draft treatments and the published treatment of resemblance is connected with a change in his account of primary qualities. In the drafts, the first sort of quality comprises whatever causes our sensations, the resemblance comparison is between cause and effect, and the vulgar often mistakenly suppose a resemblance between idea and its cause. In the published version of the *Essay*, the first sort of quality comprises the inseparable qualities of bodies and their determinations, the comparison is between those

patchwork definition, in both Draft C (quoted in Aaron 1971: 69-70) and in the published version, where we are left with the brief and misleading description of a quality as “the Power to produce any *Idea* in our mind” (E II.viii.8: 134).

If Draft A is the frame upon which the *Essay* was built (and it is), then secondary and tertiary qualities are bare powers. Why does Locke believe that our ideas of secondary qualities represent mere capacities? Recall that Locke believes that the redness, the squeakiness, and the sourness that you find in your ideas don’t resemble anything out in the world. He would not, however, be at all happy to say that our judgments about color, sound, smell, and taste are all false. He wants our ideas of secondary qualities to provide us with knowledge (E IV.iv.4: 563-64), and he recognizes that ordinary judgments about these qualities allow us to distinguish objects for our uses (E II.xxxii.15: 389). These anti-skeptical and pragmatic attitudes push him to interpret ordinary utterances about secondary qualities so that they come out right. According to Locke, we can do that by analyzing secondary qualities as powers: “if Sugar produce in us the *Ideas*, which we call Whiteness, and Sweetness, we are sure there is a power in Sugar to produce those *Ideas* in our Minds, or else they could not have been produced by it” (E II.xxxi.2: 375, Ayers 1991: 1.38-39).

Locke draws the consequence that there would be no “Imputation of *Falshood* to our simple *Ideas*, if by the different Structure of our Organs, it were so ordered, That *the same Object should produce in several Men’s Minds different Ideas* at the same time” (E II.xxxii.15: 389). According to Locke, “all things that exist are only particulars” (E III.iii.6: 410). The relevant idea that determines whether an object is to be called ‘red’ is thus only a particular idea in the

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qualities and the ideas that best represent those qualities, and Locke himself believes that those ideas resemble those qualities. For Walmsley’s different view of the matter, see Walmsley 2004: 28-31.

speaker's head, and this can't steer us wrong, not matter what's inside the heads of others (Ayers 1991: 1.207-09).

Because Locke thinks that primary qualities are inseparable from bodies, he believes that primary qualities aren't powers to produce ideas in us. I'll discuss his argument for that conclusion after I've discussed his inseparability theses.

#### **Fourth Distinction, Part I: The Genera of Primary Qualities are Inseparable from Bodies**

Locke advances four propositions about the inseparability of primary qualities at the beginning of E II.viii.9. Primary qualities are 1) "such as are utterly inseparable from the Body, in what estate soever it be," 2) "such as in all the alterations and changes it suffers, all the force can be used upon it, it constantly keeps," 3) "such as Sense constantly finds in every particle of matter, which has bulk enough to be perceived," and 4) such as "the Mind finds inseparable from every particle of matter, though less than to make it self singly be perceived by our Senses."<sup>9</sup> Thesis three is clearly an *a posteriori* claim. Thesis one seems to summarize the theses that follow.

The epistemic status of theses two and four is controversial. Some argue that they are trifling, that is, mere enunciations of the qualities in the abstract idea of body (Bennett 1971: 90, Davidson and Hornstein 1984: 285, Atherton 1992: 115, Downing 1998: 401-03). In favor of this, we may observe that Locke's rejection of *de re* inseparability (E III.vi.4: 440) seems to contradict any other reading. On the other hand, this account doesn't fit with the brevity of Locke's descriptions of the constituents of the abstract idea of body (at E II.xiii.11: 171, E II.xxiii.22: 397, E III.vi.33: 460, E III.x.15: 498, and E IV.vii.13: 604) nor with his implication that the result of pounding a body with "all the force that can be used

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<sup>9</sup> My enumeration follows R. Wilson 2002: 203.

upon it' will still have primary qualities (E II.viii.9: 134). Moreover, it would be odd for Locke to put so much effort into justifying what would be, by his lights, a trifling thesis.

Arnold Davidson and Norbert Hornstein and Robert Wilson rightly emphasize Locke's use of transdiction, that is, his inference from perceptible cases to imperceptible cases. They (Davidson and Hornstein 1984: 285-89, Wilson 2002: 204-11), however, restrict the inference to mere inductive extrapolation: in perceptible cases, bodies have primary qualities, so they probably have them in imperceptible cases as well. McCann (1994: 61-62, 65) considers the inference to be substantive yet known independently of experience (in Lockean terms, a non-trifling proposition, known through intuition or demonstration).

Locke defends his inference as follows,

For division (which is all that a Mill, or pestel, or any other Body, does upon another, in reducing it to insensible parts) can never take away either Solidity, Extension, figure, or mobility from any Body, but only makes two, or more distinct separate masses of Matter, of that which was but one before (E II.viii.9: 135).

The modal expression 'can never' suggests that McCann is right, since, as Kant once said, experience tells us what is, but not that it is necessarily. The inseparability Locke asks us to consider in E II.viii.9 is something like the connections between primary qualities he describes in E II.xxiii.17, E III.x.15, and E IV.iii.14 and even more like the processes that he says that watchmakers and locksmiths can make without trial in E IV.iii.25 (cf. Winkler 1992: 153-54).

### **Third Distinction, Part II: Primary Qualities are Not Dispositions to Produce Ideas in Us**

Locke chooses the example of wheat with imperceptible particles in mind. Ground wheat is flour, of course, and since flour is a powder, it is difficult to see the features of its smallest constituents. If a perceiver's vision is weak enough or the flour is very well ground, then the

each of the smallest particles in the flour is “less than to make it self singly be perceived by our Senses” (E II.viii.9: 135). Though we cannot perceive these particles with the naked eye, Locke believes that reason tells us that these small particles exist and, no matter how small, they possess primary qualities (Maier 1968: 64). Here Locke follows Democritus (A37 Barnes 1987: 247), Descartes (AT 8a 324 CSM 1. 286-87), and Boyle ([1666] 1999: 5.307, Aaron 1971: 121-122).

Locke’s concern to show that imperceptible particles possess primary qualities should be seen as part of a tacit argument for the thesis that primary qualities are not dispositions to produce ideas in us. If all imperceptible bodies possess primary qualities then those primary qualities are not dispositions to produce ideas in us, since imperceptible bodies have no such dispositions (Cummins 1975: 409-10, Stuart 2003: 70). For his purposes, Locke tells us, he needs to

distinguish the *primary*, and *real Qualities* of Bodies, which are always in them, (*viz.* Solidity, Extension, Figure, Number, and Motion or Rest; and are sometimes perceived by us, *viz.* when the Bodies they are in, are big enough singly to be discerned) from those *secondary* and *imputed Qualities*, which are but the Powers of several Combinations of those primary ones, when they operate, without being distinctly discerned (E II.viii.22: 140).

The contrast that he wants us to heed is between qualities are possessed by every material body, including imperceptible ones, and qualities are not possessed by imperceptible bodies, since those qualities are dispositions to produce ideas in us.

Against this line of reasoning, Bolton (1976a: 494n) tries to preserve Locke’s definition of qualities as powers to produce in ideas us by arguing, “The fact that a particle is insensible, however, does not show that it has *no* powers to produce ideas”. She offers three reasons: first, “it would produce ideas if suitably magnified” (*ibid.*). Perhaps and perhaps not, but when Locke defends the inseparability of primary qualities from the fragments of the flour, he surely isn’t making a point about the possible capacities of microscopes. We are

supposed to divide the grain fragments in thought and conclude that the results possess primary qualities whether or not they have powers to produce ideas in us. If the flour argument shows anything, it shows that corpuscles possess primary qualities independently of whether they can be seen by any means at all. Next, Bolton argues, “Locke holds that it is by means of the primary qualities of insensible particles that our ideas of colours, odours, etc. *are produced*” (ibid). Fair enough. We should therefore restrict our focus to those corpuscles that are not involved in the production of sensation. “Finally”, Bolton argues, “it is because of the primary qualities of insensible particles that a body has its ‘tertiary’ powers, or powers to cause changes in other bodies, thereby altering the ideas they produce” (ibid.). Generally speaking, however, individual corpuscles make no differences at the level of experience and Locke believes that primary qualities are inseparable from individual corpuscles, not just their aggregates.<sup>10</sup>

Setting aside worries arising out of Locke’s misbegotten definition of ‘quality’, we should be careful to avoid a fallacy. It does not always follow from the premise that a determinable quality F is G that the determinate qualities that fall under F are also G. After all, the determinable quality *extended* is inseparable from bodies but the determinate quality *one foot tall* is not. Let me go slowly and explicitly, so that we may see that Locke’s swift and tacit inference is valid.

Divide the primary qualities into three groups. Begin with those qualities that are determinate and inseparable: solidity and mobility. If imperceptible bodies without any dispositions to produce ideas in us possess these qualities, then these qualities are not dispositions to produce ideas in us. In a second group, include determinate primary qualities

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<sup>10</sup> Bolton seems to have changed her views on some of these matters. In my opinion, her later (2001: 109-12) treatment of Locke on primary and secondary qualities is excellent.

that can be possessed by both imperceptibly small bodies and ones that are visibly large. *Sphericity, single, convex everywhere, and traveling at 10 meters per second* may be possessed by a corpuscle or by a baseball. If a corpuscle does not have any power to produce ideas in us, then none of its qualities is a power to produce ideas in us, no matter where these qualities are instantiated. The remainder are varieties of extension and bulk. Those bodies that are too small to be seen possess different determinate qualities in this group than bodies of perceptible size. However, it would be incredible if *being one meter long* were a bare power to produce ideas in us while *being ten microns long* were not. Lengths and volumes are too homogenous for that to be a serious possibility. Therefore, we may conclude that primary qualities are not essentially dispositions to produce ideas in us.

### **Third Distinction, Part II: The Genera of Secondary Qualities are Separable from Bodies**

In E II.viii.9, Locke argues that portions of matter continue to possess primary qualities, even after they have been pulverized to imperceptible pieces. The complementary thesis is that portions do not continue to possess secondary qualities after they have been pulverized into imperceptible pieces. Secondary qualities are dispositions to produce ideas in us, and imperceptible bodies are imperceptible because they lack such dispositions (Bolton 2001: 111).

Locke makes two other suggestions about the separability of secondary qualities that are worth examining. The first has to do with transparency and flows from Locke's adoption of a Boylean theory of colors. Insipid, silent, odorless, transparent bodies don't fall under any of the genera of secondary qualities (Rickless 1997: 303, Downing 1998: 402-03n46). According to Locke, 'insipid' and 'silence' signify the absence of ideas of taste and sound (E II.viii.5: 135, Woolhouse 1983: 150).

One might have thought that transparency was the least common of these privative attributes, but Locke suspects that, viewed with sufficiently strong lenses, everything is transparent. There are three reasons for thinking that he believes this. First, in discussing the role of analogy in natural philosophy, he offers as examples the production of colors by “the different refraction of pellucid Bodies” (he must have in mind prisms and the like) and the production of color by different arrangement of “watered Silk.” (The latter phenomenon is actually produced by diffraction, though Locke couldn’t have known that.) He concludes “that the Colour and shining of Bodies, is in them nothing but the different Arrangement and Refraction of their minute and insensible parts” (E IV.xvi.12: 665-66), that is to say, in something like the way different arrangements of prisms produce colors.

Second, in discussing the possibility of microscopical eyes, Locke supposes that if we could see much better the colors that we see would “disappear” and be replaced with “an admirable Texture of parts of a certain Size and Figure” (E II.xxiii.11: 301). His examples from the microscope intended to illustrate his thesis (sand, pounded glass, hair, and blood) are all cases in which an object that looks entirely colored under ordinary conditions turns out to be either entirely or mostly transparent when viewed under a microscope (Maier 1968: 66-67). Third, Boyle had observed, “multitudes of Bodies, there are, whose Fragments seem Opacous to the naked Eye, which yet, when I have included them in good *Microscopes*, appear’d Transparent” ([1664] 1999: 4.52, C. Wilson 1995: 230), and tentatively suggested that this might be true universally. Locke often borrowed physical doctrines wholesale from Boyle. Indeed, this is an interesting case of borrowing a near-contradiction, since the doctrine that all color is the result of refraction and that every body is transparent under sufficient magnification seems to be in some tension with corpuscularianism. The smallest

corpuscles themselves can't be transparent, one might have thought, since transparent objects let light pass through them.<sup>11</sup>

One final way in which Locke believes that secondary qualities may be separated from bodies is by removing all perceivers from the world:

were there no fit Organs to receive the impressions to receive the impressions Fire makes on the Sight and touch; nor a Mind joined to those Organs to receive the *Ideas* of Light and Heat, by those impressions from the Fire, or the Sun, there would yet be no more Light, or Heat in the World, than there would be pain if there were no sensible Creature to feel it, though the Sun should continue just as it is now, and Mount *Ætna* flame higher than it ever did (E II.xxxi.2: 376).

Alexander (1985: 176) argues that in this context, 'light' and 'heat' refer to ideas. I'm not inclined to agree (nor is Rickless 1997: 303-04), but, even if Alexander were right, the doctrine that powers to produce ideas in animals would vanish if all the animals vanished follows from Locke's metaphysical premises.

According to Locke, "*Powers are Relations*" (E II.xxi.19: 243, cf. E II.xxxi.8: 381, Boyle [1671] 1999: 6.521-22, Anstey 2000: 86-87). He also asserts that relations cease to obtain whenever one of the relata cease to exist: "if either of those things be removed, or cease to be, the Relation ceases, and the Denomination consequent to it, though the other receive in it self no alteration at all" (E II.xxv.5: 321). I doubt that either of these premises are universally true: the capacity to grow is a power in Locke's dominant sense but not a relation, and I don't think that Bridget Fonda ceased to be Henry Fonda's grand-daughter when he ceased to exist. Still, those assumptions, along with Locke's thesis that secondary

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<sup>11</sup>Newton develops this tension in fruitful way, building on the proposition that "The least parts of almost all natural Bodies are in some measure transparent: And the Opacity of those Bodies ariseth from the multitude of Reflexions caused in their internal Parts. That this is so has been observed by others and will easily be granted by them that have been conversant with Microscopes" (*Opticks* Bk. 2, Pt. 3, Prop. 2, Thackray 1968).

qualities are powers to produce ideas in us entail that secondary qualities are separable from bodies by eliminating us, which is what Galileo ([1623] 1957: 274) had concluded.<sup>12</sup>

### **Fifth Distinction, Part I: Secondary qualities do not belong to bodies as they are in themselves**

Lucretius argued from the variable colors of objects that they had no color in the dark (*De Rerum Natura* 2.799-809, Guerlac 1986: 10). Sextus Empiricus appealed to variable appearances as a mode of bringing about the suspension of judgment (*Outlines of Pyrrhonism* 1.91-99, Bolton 1983). Locke argues from the variable appearances of the colors in porphyry to the conclusion that those colors don't belong to porphyry as it is in itself. Actually, his main conclusion is, once again, that ideas of colors don't resemble anything in the stone, but, in my judgment, the sub-conclusion that colors don't represent intrinsic qualities of porphyry is more interesting.

Locke asks us to

consider the red and white colours in *Porphyre*: Hinder light but from striking on it, and its Colours Vanish; it no longer produces any such *Ideas* in us: Upon the return of Light, it produces these appearances on us again. Can anyone think any real alterations are made in the *Porphyre*, by the presence or absence of Light; and that those *Ideas* of whiteness and redness, are really in *Porphyre* in the light, when 'tis plain *it has no colour in the dark?* It has, indeed, such a Configuration of Particles, both Night and Day, as are apt by the Rays of Light rebounding from some parts of that hard Stone, to produce in us the *Idea* of redness, and from others the *Idea* of whiteness: But whiteness or redness are not in it at any time, but such a texture, that hath the power to produce such a sensation in us (E II.viii.19: 139).

I would reconstruct his premises as follows:

#### **1. Porphyry is red and white in the light.**

He asks us to consider the red and white colors in porphyry and says that they vanish when we obstruct the light.

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<sup>12</sup> Boyle's view of the question is slippery ([1666] 1999: 5.309-22) and much discussed (Jackson 1929: 59-60, Curley 1972: §4, Alexander 1985: 70-84, Anstey 2000: ch. 4).

## **2. Porphyry is not red and white in the dark.**

Locke tells us that porphyry “has no colour in the dark.” According to Samuel Rickless (1997: 315), Locke just assumes that bodies lack colors in the dark, and this assumption saps its persuasive force. I think rather that the argument turns on peculiarities of porphyry, a slightly reddish rock with little crystals in it. Up close, the crystals look white and observers can see the reddish color. At a moderate distance, even in good light, the stone looks merely grey.

The third premise is

## **3. Neither the presence nor the absence of light causes a real alteration in porphyry.**

This is the obvious assertoric content of the rhetorical question “Can anyone think any real alterations are made in the Porphyre, by the presence or absence of light?”

Peter Geach (1994: 71-72) calls the following proposition the Cambridge criterion of change: “The thing called ‘x’ has changed if we have ‘F(x) at time  $t'$  true and ‘F(x) at time  $t''$  false, for some interpretation of ‘F’, ‘ $t'$ , and ‘ $t''$ .” Geach calls a thing’s meeting the Cambridge criterion without really changing ‘a mere Cambridge change’ as when the number five ceases to be the number of someone’s children. The above premises amount to saying that porphyry loses its red and white colors in a mere Cambridge change (cf. Heyd 1994: 22-23). Behind Locke’s claim that porphyry doesn’t really change when the light is blocked off must be something like the following dependency thesis: if a body undergoes a real change from being F to not being F, that change must depend on a change in constitution or because it

acquired different fundamental explanatory qualities.<sup>13</sup> Hindering light from striking a rock doesn't do either of those things.

There are two more principles that Locke tacitly relies upon to get from the premises to the conclusion. The first is a representational principle:

**4. If an idea resembles a quality in a body, then the quality belongs to the thing as it is in itself.**

Locke believes that only resembling ideas represent things as they are in themselves (Goldstick 1986, Downing 1998: 389-92). He writes,

the greatest part of the *Ideas*, that make our complex *Idea* of *Gold*, are Yellowness, great Weight, Ductility, Fusibility, and Solubility, in *Aqua Regia*, *etc.* all united together in an unknown *Substratum*; all which *Ideas*, are nothing else, but so many relations to other Substances; and are not really in the Gold, considered barely in it self (E II.xxiii.37: 317).

Earlier I argued that we should interpret Locke's writing of 'ideas not being in things' as meaning that the ideas don't resemble anything in the things. Given that interpretation, Locke here asserts that most of our ideas in the complex idea of gold represent relational features and don't resemble anything in the gold. This suggests (though it does not imply) that, on his view, if an idea represents a relational quality, then it doesn't resemble a feature in the body. The conditional statement would make the argument in E II.viii.19 work, and it fits with Locke's theory of representation.

The second principle he needs is a metaphysical principle:

**5. If a body can lose a quality in a mere Cambridge change, then the quality doesn't belong to it as it is in itself.**

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<sup>13</sup> To avoid circularity, the fundamental explanatory qualities may be given by other considerations, such as the ones that Locke offers. A change in those qualities is just a matter of meeting the Cambridge criterion for change with respect to them. I added the clause about constitution to save Locke from a counter-example that Brian Weatherson presented on his weblog ("Change," September 21, 2003, *Thoughts, Arguments, and Rants*, <http://tar.weatherson.net/archives/000706.html>)

I think that this principle is both ancient (*Theaetetus* 154b) and plausible. Locke's conclusion is that no reasonable person can believe that "those *Ideas* of whiteness and redness are really in *Porphyre* in the light" and tells us, "whiteness or redness are not in [porphyry] at any time." As I've argued, he uses 'whiteness' and 'redness' as names for ideas here. He is, once again, arguing for a special case of his negative resemblance thesis (Bolton 1983: 355).

### **C. The ideas of red and white don't resemble qualities in porphyry.**

Supplemented with his tacit principles, Locke's argument is valid. Setting aside worries about premise 4 and Locke's theory of representation, it seems to me porphyry is red all the time (though its redness is sometimes hard to see) and that the crystals are white never (it's just a trick of the light), so premises 1 and 2 are false. There are, perhaps, better examples of mere Cambridge changes of color (Bennett 1968: 105-07, Guerlac 1986: 8,10, Jacovides 2000: 150-55, 159)

### **Fifth Distinction, Part II: Primary Qualities Belong to Objects as They are in Themselves**

Locke tells us that the idea of a primary quality is "an *Idea* of the thing, as it is in it self, as is plain in artificial things" (E II.viii.23: 140). Why should artifacts (as opposed to animals, plants, or minerals) make it plain that primary qualities belong to things as they are in themselves? The salient feature about primary qualities in the artifacts that Locke has in mind, such as clocks and locks, is that they explain how the artifacts work. The implicit principle that Locke relies upon in his justification is that if a quality is explanatory in a relatively deep way, then it belongs to a thing as it is in itself.

With that principle in mind, consider E II.viii.20, which describes a phenomenon and adds a rhetorical question: "Pound an Almond, and the clear white *Colour* will be altered into a dirty one, and the sweet *Taste* into an oily one. What real Alteration can the beating of

the Pestle make in any Body, but an Alteration of the *Texture* of it?” The answer must be ‘only that,’ but it isn’t obvious what the question means.

In light of his treatment of real alterations in the porphyry argument, I suggest that Locke thinks of real alterations as changes in a thing’s intrinsic features. The reader who considers the example is supposed to consider the interaction as an interaction of intelligible features and come to the conclusion that the only intelligible and explanatory feature that will be changed in the almond is its texture (Alexander 1985: 127, Heyd 1994: 25-26, McCann 1994: 66). Since Locke believes that only deep explanatory features are intrinsic, he concludes that the almond’s texture, as opposed to its color and taste, belongs to the almond as it is in itself.

### **First Distinction, Part II: Secondary Qualities are Not Deeply Explanatory**

As I said in the last section, Locke’s assertion that artifacts make it obvious that primary qualities belong to things as they are in themselves shows that he believes that deeply explanatory qualities belong to things as they are in themselves. That conditional doctrine helps prove what has thus far gone without saying. Since Locke believes that secondary qualities are relational, we may conclude that he believes that they aren’t deeply explanatory.

The conditional principle, alongside Locke’s thesis that all powers are relations, implies that no power is deeply explanatory. It isn’t at all obvious that such qualities as *fragile*, *malleable*, and *conductive* are never explanatory. The denial that any power is explanatory does fit with his repeated claims that powers to affect bodies are akin to powers to produce ideas (E II.viii.10, 23); he goes so far as to call powers to affect bodies “Secondary Qualities, mediately perceivable” (E II.viii.26: 143). More broadly, it fits well with his model of explanation, in which ideas and *propria* flow from intrinsic essences, and

relations all “terminate” (E II.xxv.9: 323) in the comparison of ideas (Woolhouse 1983: 92-94).

I should point out a wrinkle in this relatively neat story. In E II.viii.26, Locke not only asserts that secondary qualities (mediately and immediately perceived) depend on primary qualities, but he also asserts that secondary qualities are those “whereby we take notice of Bodies, and distinguish them one from another.” If we lean on this in a certain way, the passage suggests that secondary qualities explain facts about human awareness and classification. Perhaps the most precise thing to say is that Locke has a hierarchy of explanatory features. Primary qualities are more fundamental than secondary qualities, and relational qualities, in his view, cannot be explanatory at a certain depth.

### **Sixth Distinction, Part I: Secondary Qualities are not Real Beings.**

Ontological questions are not at the forefront of the chapter on primary and secondary qualities, but remarks scattered through the *Essay* do suggest that Locke denies that secondary qualities, like other powers, are real beings that ultimately constitute elements of the world. So far as we know, the oldest way to contrast secondary and primary qualities is with respect to their reality. Democritus wrote, “By convention colour, by convention sweet, by convention bitter: in reality atoms and void” (B125, Barnes 1987: 254). Locke tells us that one of the points of his excursion into natural philosophy is “to distinguish the *primary*, and *real Qualities* of Bodies . . . from those *secondary* and *imputed Qualities*, which are but the Powers of several Combinations of those primary ones” (E II.viii.22: 140). By real qualities, Locke certainly didn’t mean what Ockham or Descartes meant (Menn 1995). That is, Locke doesn’t believe that primary qualities can exist independently of their bodies. Rather, he explains, he calls them “*real Original*, or *primary qualities*, because they are in the things themselves, whether they are perceived or no: and upon their different Modifications

it is, that the secondary Qualities depend” (E II.viii.23: 141, cf. E II.viii.14, 17, 18, 24, 25, cf. Rickless 1997: 305, Stuart 2003: 93n5). He calls them real (and original and primary) because they belong to things as they are in themselves, they belong to imperceptible bodies, and because they are explanatory--considerations that we have already touched upon.

Other passages suggest a further, ontological significance to Locke’s description of primary qualities as real.<sup>14</sup> First, at E II.xxxi.2, Locke complains that our terminology is misleading: “the Things producing in us these simples *Ideas*, are but few of them denominated by us, as if they were only the causes of them; but as if those *ideas* were real Beings in them” (cf. Boyle [1666] 1999: 5.310-15, Alexander 1985: 71-72, Anstey 2000: ch. 4). Fire, for example, “is denominated . . . Light, and Hot”; it would be more accurate to call it lightful and hotful, since our present terminology gives us the false impression that light and hot are real beings in the fire. Along the same lines, Locke denies that faculties are “real beings” (E II.xxi.6: 237). When he says this, he doesn’t mean to “deny there are *Faculties* both in the Body and Mind: they both of them have their *powers* of Operating, else neither the one nor the other could operate. For nothing can operate, that is not able to operate; and that is not able to operate, that has no *power* to operate” (E II.xxi.20: 243). Locke believes talk of powers and faculties is legitimate in philosophy “cloathed in the ordinary fashion and Language of the Country” and intended for a general audience; he believes that references to powers may be paraphrased away by talking about what a thing is able to do; and he believes that ordinary ways of speaking mislead us into thinking that powers are agents (E II.xxi.20: 243-44). Finally, recall that Locke believes that secondary qualities, like all powers, are relations. He doesn’t think much of the ontological status of relations,

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<sup>14</sup> John Carriero has a manuscript in which he argues for an ontological interpretation of *Essay* E II.viii. I wasn’t convinced when I first read it, but I’ve come around.

describing them as “having no other *reality*, but what they have in the Minds of Men (E II.xxx.4: 373).<sup>15</sup>

Rejecting the existence of secondary qualities as real beings does not commit one to believing that no object can be rightly described as colored, noisy, tasty, smelly, or warm. A reasonable philosopher may believe that barns are red without believing that any rednesses, either particular or universal, inhere in them (Quine 1980: 10). Galileo had written, “tastes, odors, colors, and so on are no more than mere names so far as the object in which we place them is concerned, and that they reside only in the consciousness” ([1623] 1957: 274). Locke’s work may be taken as an elaboration on that theme. Concrete secondary quality terms rightly apply to bodies, but the only existing entities denoted by our secondary quality words are ideas.

According to Locke, secondary qualities are not real entities that exist in bodies, and, thus, philosophers need not investigate deeply the conditions under which they come into existence and go out of existence. On his view, the real and explanatory entities are primary qualities, the bodies in which they inhere, ideas, and the minds in which they inhere. The states of affairs in which these entities are arrayed are the basic facts that make our assertion about secondary qualities true or false. There is nothing to keep us from decreeing that an object is properly described as ‘red’ if it appears red to some observer (Bennett 1968: 115).

### **Sixth Distinction, Part II: Primary Qualities, with the Possible Exception of Some Sorts of Velocity, are Real Beings**

Locke’s chapter on primary and secondary qualities begins with six sections on whether positive ideas might have privative causes. His answer is yes. Part of his discussion assumes a kind of folk metaphysics which he calls “the common Opinion” (E II.viii.6: 134). Shadows

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<sup>15</sup> Here I am indebted to Walter Ott.

(E II.viii.5: 133) and holes (E II.viii.6: 133-34) may cause ideas of black even if they are mere privations. Another part of his argument considers the hypothesis that our ideas are caused by a change in velocity in the corpuscles in our animal spirits. If ideas are “produced in us, only by different degrees and modes of Motion in our animal Spirits, variously agitated by external Objects,” then a privative cause would cause a positive idea, since “the abatement of any former motion, must as necessarily produce a new sensation, as the variation or increase of it” (E II.viii.4: 133). In the end, Locke tells us, the question of whether there are privative causes turns on “*Whether Rest be any more a privation than Motion*” (E II.viii.6: 134). This remark may seem to neglect the preceding suggestion that the abatement of motion might be a privative cause, but really it doesn’t. Locke’s thought is that, for reasons of Galilean relativity, it may turn out that velocity is always relative to a frame of reference and if that were true then neither rest nor deceleration would be intrinsically privative. (Ayers 1991: 1.223-36 argues that Locke moved away from relativism and towards the doctrine of absolute space.) Locke sets aside shadows and holes as candidate privative causes, because of his commitment to corpuscularianism. He believes that the only possible privative causes will be primary qualities, since he believes

When we go beyond the bare *Ideas* in our Minds, and would enquire into their Causes, we cannot conceive any thing else, to be in any sensible Object, whereby it produces different *Ideas* in us, but the different Bulk, Figure, Number, Texture, and Motion of its insensible Parts. (E II.xxi.73: 287).

Moreover, the only primary qualities that Locke suspects might be privations are connected with motion, rest and the abatement of motion. He believes that the other primary qualities are real beings and that they are part of the furniture of the world in a way that secondary qualities could not be.

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