

Locke on Perception

Michael Jacovides

For Locke, the first step in an investigation of perception should be reflection: “*What Perception is*, every one will know better by reflecting on what he does himself, when he sees, hears, feels, *etc.* or thinks, than by any discourse of mine” (2.9.2).¹ As a second step, I say, we may learn from reading him.

Locke’s use of the term ‘perception’ is somewhat broad. At one point, he tells us that “having *Ideas* and Perception” are “the same thing” (2.1.9). Elsewhere, he includes perceiving the agreement of ideas and perceiving the meaning of signs among the varieties of perception (2.21.5). What I have to say will be about what psychologists today classify as perception.

After sketching the background to Locke’s theory, I’ll describe the general psychophysical principle that governs his approach to sensation and two exceptions to that principle. I’ll then elucidate some of the subtleties of Locke’s account of the visual perception of shape, subtleties that end up supporting an orthodox interpretation of his answer to the Molyneux question. I’ll close with some remarks on his account of time perception, in which I’ll explain his reasons for thinking that we get the idea of succession and duration from reflection, even though he believes that we get ideas of our measures of duration from sensation.

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1 General Considerations on Sensation

1.1 Corpuscularianism and Sensation

At *Essay* 2.1.23, Locke defines sensation as a sort of corporeal cause: “*Sensation . . . is such an Impression or Motion, made in some part of the Body, as produces some Perception in the Understanding*” (see also 2.1.3). Elsewhere, he defines sensation as a kind of perception, a “*Perception, which actually accompanies, and is annexed to any impression on the Body, made by an external Object, being distinct from all other Modification of thinking, furnishes the mind with a distinct Idea, which we call Sensation*” (2.19.1). The terminological variance isn’t of deep importance, since the underlying account is the same.

Locke argues that external bodies affect our sense organs through the mediation of a sea of imperceptibly small particles (2.8.12-14; McCann 1994: 62). If an external object affects a sense organ, the object acts through impulse, either immediately or through bodies in between the external object and the organ (2.8.11). Our eyes, ears, and noses sense distant objects, which can’t push on them immediately, so those objects affect our organs through intermediate bodies. There are no perceptible bodies between external objects and our eyes, ears, and noses, so these intermediate bodies must be imperceptibly small.

According to Locke, sensation gives us our first ideas (2.1.23). Fetuses in the womb, he guesses, have sensations of hunger and warmth (2.9.5). The ideas produced by sensation then go on to become raw material for other operations (2.1.23). Not only are ideas of sensation temporally first in Locke’s system, but in some respects, they are cognitively first. He defines a simple ideas as ‘clear,’ “when they are such as the Objects themselves, from whence they were taken, did or might, in a well-ordered Sensation or Perception, present them” (2.29.2). Locke’s definition of clear ideas follows Descartes’s in some respects

(Descartes 1985-1991: 1.207), but where Descartes explains clear ideas by analogy with things clearly seen, for Locke ideas produced by sensation are themselves paradigmatically clear.

Sometimes Locke will talk of sensations as if they were qualities existing in the world and carried into the mind, and sometimes he takes care to disown that implication. After declaring “*Our Senses*, conversant about particular sensible Objects, do *convey into the Mind*, several distinct *Perceptions* of things,” he emends: “which when I say the senses convey into the mind, I mean, they from external Object convey into the mind what produces there those *Perceptions*” (2.1.3). A related example of loose talk is at *Essay* 2.3.1, where he implies that nerves convey ideas from sense organs to the brain.

At *Essay* 2.8.8, Locke clarifies that when he writes of an idea being in the external objects, he means to refer to the quality in the object that causes the idea. He admonishes us that we ought to be careful to distinguish ideas from modifications of matter (2.8.7). The advice seems like a funny piece of business, since few of his readers have interchanged the terms ‘idea’ and ‘quality’ as much as Locke does in the *Essay*.

The conflation and clarifications make more sense when we consider their background, which is the scholastic theory of perception. On this theory, sensible species become detached from underlying substrata and make their way into our senses and our understandings (M.A. Smith 1981). This explains why Locke lists ‘species’ among the terms that refer to ideas (1.1.8). When he considers it carefully and clearly, Locke thinks that the scholastic theory of perception is “gibberish” (Works 9.215). Even so, when he isn’t on guard, remnants of the view creep into his writing.

1.2 *Psycho-Physical Principles*

Locke argues that since we can't possibly discover a natural connection between impulse and motion and our ideas of secondary qualities, we can't help attributing the connection "to the arbitrary Will and good Pleasure of the Wise Architect" (4.3.29). I don't want to get into the somewhat vexed question of how exactly God brings about this connection, but I do want to consider some basic features of Locke's account of how these psycho-physical connections run.

Although he includes "by what Motions of our Spirits, or Alterations of our Bodies, we come to have any Sensation by our Organs" (1.1.2) among the questions that he won't pursue in the *Essay*, sometimes Locke can't help himself. In cases of sensation, the body is affected in a certain way which causes "fluid and subtile Matter, passing through the Conduits of the Nerves" to produce perception in the brain (3.9.16), an organ he describes as "the mind's Presence-room" (2.3.1; a 'presence room' is a royal reception chamber).

The character of the produced ideas is partially determined by the character of our sense organs. Locke classifies simple ideas of sensation by the organs that stimulate them (3.4.16). (At one point, for the sake of an argument, he assumes that there are five senses, namely, hearing, taste, smell, sight, and touch, but he adds that there might be good reasons for counting more [2.2.3].) Among the causes of obscure ideas, he includes dull organs, slight and transient impression on the organs, and weakness of memory. Using an ancient simile, he compares sensation to a wax and seal, which depends on the wax being the right consistency and the seal's being applied with the right force (2.29.3).

Locke believes that qualities in objects are "united and blended", but "the *Ideas* they produce in the Mind, enter by the Senses simple and unmixed" (2.2.1). He justifies this thesis by observing that even if ideas are produced in a single organ (as ideas of motion and color

are produced in sight), they are still as distinct as ideas produced by different organs. This is true, but of course, any two ideas are distinct, or they wouldn't be two. The important part of the claim is that the produced ideas are simple.

Locke says of this doctrine, "t'is plain" (ibid.), but tisn't (Hall 1987: 12-13). His empiricist predecessor Gassendi didn't assume that our senses only produce simple ideas in us (LoLordo 2007: 75), and it certainly isn't obvious in itself. We are better off looking to Descartes for antecedents to his view. Descartes's fourth observation governing sensation in the 6th *Meditation* is that "any given movement occurring in the part of the brain that immediately affects the mind produces just one corresponding sensation" (1985-1991: 2.60).

Let me suggest that when he says that ideas enter the mind simple and unmixed, he means that the first ideas produced in us are all simple. As we have seen, Locke stipulates that when says that an idea is conveyed into the mind, he means that our bodies have been affected in such a way as to cause those ideas. The varieties of movements in neural fluids ("animal spirits") systematically produce simple ideas and only simple ideas. This allows us to makes sense of his formula in a way that's at least superficially compatible with the complexity of phenomena presented in experience. "The Mind is wholly Passive in the reception of all its simple *Ideas*," and it actively constructs complex ideas and ideas of relation (2.12.1). Particular motions of animal spirits only produce simple ideas, but these are all jumbled together. The separate consideration of ideas requires an act of abstraction (2.11.9).

Locke qualifies his basic psycho-physical principle in two ways: first by allowing for sensory adaptation and second by giving a role to attention. Sensory adaptation is the change of responsiveness in a sense organ after being presented with a constant stimulus. In distinguishing primary from secondary qualities, Locke gives an early description of what later became known as the 'three bowl experiment' (2.8.21). If you put one hand in bowl of

warm water and the other in a bowl of cold water, and then place both hands in a bowl with lukewarm water, the same water feels warm to one hand and cold to another (Tritsch 1990).

According to Locke, the best explanation for the three-bowl experiment is that the sensation of cold is caused by a decrease in the motion of animal spirits and the sensation of heat is caused by an increase (2.8.21). The same water speeds up the animal spirits in a cooled hand and slow down the spirits in a warmed one. More generally, Locke suggests that all sensation is caused by the varying modes of motion in our animal spirits and that the abatement of this motion must therefore cause a new sensation (2.8.4). He thus offers us a neural account of sensory adaptation: our nerves are set up to register differences in temperature, rather than absolute temperature. He is following similar suggestions in Bacon (2000: 126, 131), Descartes (1985-1991: 3.66), and Boyle (1999: 344-46, 350-54, see Woolhouse 1983: 150-52).

According to Locke, in perception narrowly construed (“bare naked *perception*”) the mind is, for the most part, only passive (2.9.1). Locke believes that we are misled by the common practice of grammarians who classify ‘seeing’ and ‘feeling’ as ‘active verbs.’ Instead, we are “barely passive” in receiving ideas stimulated by bodies (2.21.72). On the other hand, he believes that some passive perceptions have active preconditions (4.13.1-2). So for example, we might move our bodies and orienting our eyes to put ourselves in a position to sense. In such cases by a power within ourselves, we put our bodies into motion and are active in that respect (2.21.72)

Attention is another activity that sets up perception and constitutes a second exception to the principle that one motion can produce only one sensation. Just as a person won’t form distinct ideas of reflection without attention, “he will no more have all the particular *Ideas* of any Landscape, or of the Parts and Motions of a Clock, who will not turn

his Eyes to it, and with attention heed all the Parts of it” (2.1.7). Locke also believes that close attention to one thing diminishes attention to others. So, if we are attentively considering one thing, we might not perceive something else which we would have noticed otherwise (2.1.8, 2.19.3). In such cases, the sense organs are affected in the very same way, but an idea is only formed when we pay attention (2.9.4).

George Berkeley (Introduction §§11-16) attacked Locke for his belief in gappy abstract ideas. The landscape and clock examples imply that Locke believes in unsaturated visual imagery, as well. On his assumptions visual imagery can be more and less filled in depending on whether the perceiver is paying attention. Existence and unity are ‘suggested’ to the understanding by every external object and every internal idea (2.7.7). Perhaps the point of ‘suggested’ is that these ideas aren’t invariably caused by entities, but only when we attend to them in a certain way. Locke is careful not to go overboard in this direction. In many cases, he tells us, if our sense organs are affected, the mind can’t refuse or alter the produced simple ideas (2.1.25).

2 Visual Perception of Shape

2.1 The Visual Array

Let us divide Locke’s account of the visual perception of shape in four, into his account of the initial arrangement of our ideas of color, his account of our perception of length, his account of our perception of two-dimensional shapes, and his account of our ultimate judgments about the three-dimensional shapes of external objects. We end with judgments of the objective shapes of bodies. We begin, according to Locke, with “a variety of shadow or colour” which is “only a Plain variously colour’d, as is evident in Painting” (2.9.8).

The last clause is often misread as ‘evident *from* Painting,’ (e.g. A.D. Smith 2000: 487 and Bolton 1994: 80n20), which isn’t what Locke says or means. He isn’t offering an argument from painting to phenomenology. Instead, he’s offering a phenomenological description. ‘Evident’ means visible here. What’s visible in the first glance at a globe is like what’s visible in a realistic painting of a globe: “When we set before our Eyes a round Globe, of any uniform colour, *v.g.* Gold, Alabaster, or Jet, ‘tis certain, that the *Idea* thereby imprinted in our Mind, is of a flat Circle variously shadow’d, with several degrees of Light and Brightness coming to our Eyes” (2.9.8). As J.L. Mackie argues (1985: 223), in this passage Locke treats ideas as the uninterpreted, intentional objects of sight. What Locke thought he saw, immediately and in the first instance, was two-dimensional.

Speaking for myself, most of what I see seems three-dimensional. Almost all psychologists in the seventeenth and eighteenth centuries, however, followed Locke in denying that we seem to see depth (A. D. Smith 2000: 481-82). Let me here pick out two sources of Locke’s belief that sight presents us with a two-dimensional array: the anatomy of the retina and the aesthetics of realistic painting.

Locke knew Kepler’s discovery that the retina is “the place of vision” (Works 9.216), and he assumes that there’s a relatively straightforward mapping between retinal stimulation and the production of ideas of color. Consider Locke’s description of what we would know if we had a good physical theory of light:

supposing the Sensation or *Idea* we name *Whiteness*, be produced in us by a certain number of Globules, which having a verticity about their own Centres, strike upon the *Retina* of the Eye, with a certain degree of Rotation, as well as progressive Swiftmess; it will hence easily follow, that the more the superficial parts of any Body are so ordered, as to reflect the greater number

of Globules of light, and to give them that proper Rotation, which is fit to produce this Sensation of White in us, the more White will that Body appear, that, from an equal space sends to the *Retina* the greater number of such Corpuscles, with that peculiar sort of Motion (4.2.11)

If we knew what particles constituted white light, then we would know that the more particles of that sort struck the retina, the more intense the resulting idea of white would be. Locke doesn't give any role to sensory adaptation here, which is a mistake, since a lump of coal in daylight actually reflects more light than a piece of white paper in the shade (Hardin 1988: 83).

Locke's supposition that the irradiation on the retina maps on to the ideas first presented in sight also leads him to conclude that apparent figures are determined by the shapes cast on the retina: "we see the figures and magnitudes of things rather in the bottom of our eyes than in God: the idea we have of them and their grandeur being still proportioned to the bigness of the area, on the bottom of our eyes" (9.217-18). As H.E. Matthews observes, "The most natural way to read this is to take the 'idea' to be the mental counterpart of the retinal image, since it is proportioned to it" (1971: 18).

A second, quite different source of Locke's belief that sight presents us with a two-dimensional array may be seen in other remarks he makes on painting. At *Essay* 2.8.6, he offers an argument that "one may truly be said to see Darkness. For supposing a hole perfectly dark, from whence no light is reflected, 'tis certain . . . it may be Painted." The premise behind the argument is that whatever can be painted can be seen. It seems to follow from that premise that we can see the two-dimensional array before us. After all, we can paint it.

Elizabeth Anscombe quotes Locke's discussion of globes and circles and suggests that Locke's variety of shadow and color

is what you'd get if, adopting the suggestion of Leonardo, you held up a glass pane vertically before you when you were looking straight ahead and supposed to be painted on it with utter accuracy *exactly* the colour behind it, as seen, in every part of it. The result represents what is thought of as the minimal, uninterpreted visual impression, which is the basis of all else (1981: 43).

Anyone who can follow Leonardo's advice would be able to see what's before him as an array of color patches. Leon Battista Alberti (39-42) had offered the metaphor before Leonardo and it's an important one in the history of art.

Locke's view that the immediate intentional object of sight is two-dimensional leads him to think of that object as a mental image. "Methinks," he writes,

the *Understanding* is not much unlike a Closet wholly shut from light, with only some little openings left, to let in external visible Resemblances, or *Ideas* of things without; would the Pictures coming into such a dark Room but stay there, and lie so orderly as to be found upon occasion, it would very much resemble the Understanding of a Man, in reference to all Objects of sight, and the *Ideas* of them (2.11.17).

If the objects of sight are mental, two-dimensional entities, then they are visual images.

Locke offers anamorphic drawings as a useful analogue for obscure ideas, since ideas "are, as it were, the Pictures of Things" (2.29.8, Hall 1990: 15-16).

2.2 *Perceived Length*

Locke believes that ideas of length are immediately received through sight. He lists extension among the simple ideas received through sight and touch (2.5), and, as we've seen, he believes that simple ideas are passively received. He tells us that it's as obvious "that Men perceive, by their Sight, a distance between Bodies of different Colours, or between the parts of the same Body; as that they see Colours themselves," which suggests similarity with respect to immediacy (2.13.2). He asserts that our perception of extension is inseparably joined to all visible and most tangible qualities, which implies our ideas of color and extension are received at the same time (2.13.24).

Someone might object that by saying that we see the distances between bodies of different colors, Locke makes the perception of distance dependent on the perception of color. But he says that we can see the distances between the parts of a body, and it isn't plausible to assume that he only has heterogeneously colored bodies in mind. I don't think that Locke had any good reason to mention the different colors of the distant bodies, but it doesn't do any harm.

To the objection that our ideas of extension are composed of parts, and thus not simple, Locke replies that they still count as simple since they're only composed of a single sort of idea (2.15.9). At the beginning of his discussion of the simple mode of space, Locke remarks that the mind finds these simple modes "in things existing" (2.13.1) and implicitly backs off what seems to be his earlier position that the senses only present us with simple ideas, narrowly so-called.

2.3 *Perceived Two-Dimensional Shape*

Let me switch topics from the visual perception of length to the visual perception of two-dimensional shape. Locke denies that we immediately receive true ideas of the shapes of things. In criticizing Malebranche's assertion that we see the sides of a cube as congruent squares, Locke replies: "This, I think, is a mistake; and I have in another place shown, how the idea we have from a regular solid, is not the true idea of that solid, but such an one as by custom (as the name of it does) serves to excite our judgment to form such an one" (Works 9.218, Lievers 1992: 410; Bolton 1994: 80). Locke's reference is to *Essay* 2.9.8: what we see is not the true shape of an object, but rather its two-dimensional projection.

Here is the last sentence of Locke's description of what happens when we look at a globe:

So that from that, which truly is variety of shadow or colour, collecting the Figure [1], [judgment] makes it [2] pass for a mark of Figure [3], and frames to it self the perception of a convex Figure, and an uniform Colour; when the *Idea* we receive from thence, is only a Plain variously colour'd, as is evident in Painting (2.9.8, numbers in brackets added).

This is a hard sentence to parse. I think that [1] and [2] refer to a two-dimensional shape and [3] is a three-dimensional shape that the two-dimensional shape comes to signify. Judgment gathers one figure from an array of shadow and color and makes it stand as a mark for another, convex figure. Given an array of color and shadow, the mind forms the idea of an intermediate figure on its way to its final judgment.

An alternative reading is to take [1] and [3] to refer to a three-dimensional shape and to take the antecedent of [2] to be 'variety of shadow or colour'. Here are three

considerations against this alternative. First, it pushes the antecedent of ‘it’ is further back than the immediately preceding noun; second, the reading is repetitive, since framing the perception of a shape doesn’t add anything to collecting the idea of a that shape; and, third, I don’t think Locke would want to say that the three-dimensional shape is collected—that is, inferred—from anything, since he emphasizes the non-rational character of that process in the sections that follow and in *Of the Conduct of Understanding*.

I conclude that Locke believes that colors come to us in a two-dimensional array and that grasping the implicit two-dimensional shapes in that array requires some cognitive processing, and, as Martha Brandt Bolton (80) observes, in the next section Locke says that we judge “*Ideas of Space, Figure, and Motion*” by “*Ideas of Light and Colours*” (2.9.9). (She argues that ideas of two-dimensional shapes don’t occur at *any* stage in Locke’s account of the perception of three-dimensional objects, 79-83, but I don’t think that the passages she cites justify the view, nor am I convinced by her attempts to explain away Locke’s talk of an imprinted idea “of a flat Circle” or his claim that we receive an idea like what is “evident in Painting.”)

The doctrine that our ideas of shape are posterior to our ideas of shadow and color is filled out a little in Locke’s account of figure perception in the chapter on the simple modes of space. Of “the Relation which the Parts of the termination of Extension, or circumscribed Space have amongst themselves,” Locke writes,

This the touch discovers in sensible bodies, whose Extremities come within our reach; and the Eye takes both from Bodies and Colours, whose Boundaries are within its view: Where observing how the Extremities terminate, either in straight Lines, which meet at discernible Angles; or in crooked Lines, wherein no Angles can be perceived, by considering these as

they relate to one another, in all Parts of the Extremities of any Body or Space, it has the *Idea* we call *Figure* (2.13.5)

Angles and the extremities of bodies and colors are immediately perceived, but the perception of shape takes an additional comparison.

2.4 *Judging Three-Dimensional Shapes*

Though Locke denies the existence of innate principles, he embraces the existence of some “inherent Faculties” (1.2.2). Other cognitive capacities are developed through experience. In particular, he believes that the ability to judge three-dimensional shape and homogeneity of true color is acquired “by a habitual custom” (2.9.8). As we’ve seen, when looking at a globe of a uniform color, the mind is presented with “that, which truly is variety of shadow or colour” and then judgment “frames to it self the perception of a convex Figure, and an uniform Colour” (ibid.) This occurs because

we having by use been accustomed to perceive, what kind of appearance convex Bodies are wont to make in us; what alterations are made in the reflections of Light, by the difference of the sensible Figures of Bodies, the Judgment presently, by an habitual custom, alters the Appearances into their Causes (ibid.).

That is, by living in the world, and seeing and handling its bodies, we come to associate the ideas of three-dimensional shapes (acquired by touch) with the two-dimensional outlines and the variations in light given to us by sight. Upon being presented with a two-dimensional array of ideas of color, we gather a two-dimensional shape from the color edges of that array, and then, by a process of habituation, make a judgment about the true three-dimensional shape of the external body. In ‘Of the Conduct of Human Understanding,’

Locke describes this last step as a ubiquitous instance of the association of ideas (Works 3.277-78).

Locke believes that this process explains how people can be fooled by *trompe l'oeil* paintings. He writes,

let any one not skilled in painting be told, when he sees bottles, and tobacco-pipes, and other things so painted as they are in some places shown, that he does not see protuberances, and you will not convince him but by the touch: he will not believe that, by an instantaneous legerdemain of his own thoughts, one idea is substituted for another (Works 3.278).

Paintings present us with a two-dimensional idea, and then, by a process of association established in other situations, we form stubborn judgments of the three-dimensional objects usually associated with those ideas.

This account requires a sequence of constantly disappearing and barely observed two-dimensional arrays of ideas. Against the objection “that this is done with so little notice” (2.9.10), he offers two replies. First, the mind acts very quickly. By way of example, we can “as it were in an instant” see all the parts of a demonstration at once, even when putting the argument in words might seem to take a long time (*ibid.*).

Second, the mind often doesn’t observe its habitual activities, especially when the habits were acquired earlier in life. He offers two illustrations here: first, the observation that we don’t notice darkness every time we blink, and second, the point that some people have catch phrases that they repeatedly use without noticing (*ibid.*).

Laura Berchielli has denied that Locke believes that the transformation from two-dimensional array to judgment of actual shape occurs in usual cases of visual perception (2002: 64), but her evidence doesn’t convince me. First, she relies on Locke’s claim that

touch is an inferior faculty to sight, “the most comprehensive of all our faculties” (2.9.9, Berchielli 2002: 50). She infers that he must believe that sight can do anything that an inferior sense can, and, since Locke believes that touch can perceive three-dimensional shapes, that sight can perceive three-dimensional shapes (Berchielli 2002: 54-55). But similar reasoning would commit Locke to believing that we can see the taste of ice cream and see the sound of music, which seems like an implausible interpretation.

Second, she cites *Essay* 2.13.5 where Locke asserts that we can see figure through sight. Since he doesn't draw a distinction between two-dimensional and three-dimensional figure there, Berchielli argues that he is committed to saying that, under standard conditions, we can see three-dimensional shape (2002: 55-56). But Locke does implicitly contrast three-dimensional and two-dimensional shapes at the end of the next section, where he is describing the invention of ideas of new shapes. Two-dimensional shapes are enclosed by lines, while three-dimensional shapes are enclosed by ‘Superfices,’ that is to say, surfaces (2.13.6). The discussion of figure perception through sight in the previous section concerns two-dimensional figures bounded by lines.

2.5 *Molyneux's Problem*

In 1693, the Irish natural philosopher William Molyneux sent Locke the following question:

Suppose a Man born blind, and now adult, and taught by his touch to distinguish between a Cube, and a Sphere of the same metal, and nighly of the same bigness, so as to tell, when he felt one and t'other, which is the Cube, which the Sphere. Suppose then the Cube and Sphere placed on a Table, and the Blind Man to be made to see. Quare, Whether by his sight,

before he touch'd them, he could distinguish, and tell, which is the Globe, and which the Cube.

Molyneux's answer was no,

For though he has obtain'd the experience of, how a Globe, how a Cube affects his touch; yet he has not yet attained the Experience, that what affects his touch so or so, must affect his sight so or so; or that a protuberant angle in the Cube, that pressed his hand unequally, shall appear to his eye, as it does in the Cube.

In the second edition of the *Essay*, Locke inserts Molyneux's question and Molyneux's reply in *Essay* 2.9.8, right after Locke's account of how our two-dimensional visual ideas are transformed into judgments of three-dimensional shapes. Locke adds his endorsement of Molyneux's answer: "the Blind Man, at first sight, would not be able with certainty to say, which was the Globe, which the Cube, whilst he only saw them: though he could unerringly name them by his touch, and certainly distinguish them by the difference of their Figures felt." As Marjolein Degenaar observes (1996: 28), Locke either clarifies or modifies Molyneux's formulation of the problem. Molyneux had asked whether the newly sighted person could *distinguish* the sphere from the cube, while Locke posed the problem of whether the newly sighted man could *name* the cube and the sphere *with certainty*. Molyneux's problem was a focus of philosophy of mind and psychology for the next two centuries (Degenaar 1996: chs. 3-5).

The standard accounts of Locke's treatment of Molyneux's problem rightly emphasize the context in which he placed it (Mackie 1976: 30; Ayers 1991: 1.65-66; Lievers 1992: 407-10). Locke has just argued that the connection between the two-dimensional array

impressed by sight and our judgments of three-dimensional objects is established by what we customarily perceive. It follows from that account that a newly sighted person would not have established that association and would not transform ideas of the variously colored circle and irregularly shaped hexagon into a homogeneously colored globe and cube. Locke wraps it up his discussion by asking the reader “to consider, how much he may be beholding to experience, improvement, and acquired notions, where he thinks, he has not the least use of, or help from them” (2.9.8). In context, this means that the newly sighted person doesn’t have the experience to connect spheres and cubes with the two-dimensional ideas of hexagons and circles they produce in the mind.

Edward Synge, the eventual Archbishop of Tuam, had answered Molyneux’s question in a different way, and his reply made its way back to Molyneux and Locke (Bolton 1994, 78-79). According to Synge,

The idea which such a blind man must needs by his touch alone form of a globe will be this that it is a body which is Exactly alike on all Side<s> Part of the *idea* which such a man must needs by his touch conceive of a Cube will be that it is a body which is not alike in every part of its Superficies The *Image* which at the first Sight such a man will form of a globe must needs represent it as a body which is alike on all sides which consequently must be agreeable to the *idea* which he before had of i<t> and different from that *Idea* which he had of a Cube. for turn a globe ten thousand ways it Still Carryes the same aspect if it be all of the same collour which wee now Suppose. The *Image* which upon the first View such a man will frame of a Cu<be> must needs be this that it is a body which is not alike in all the parts of its Superficies which consequently must be agreeable to the *idea* which

before he had of it and different from that *idea* which he had of a globe. For a cube do's not carry the same aspect when it is exposed to our sight in different <positions> (Corr. #1984, material in brackets is reconstructed by E.S. de Beer).

Synge assumes that the blind know through touch that every part of the surface of a sphere is similar to every other part and that the surface of a cube doesn't exhibit the same similarity. From those assumptions he offers two reasons for his positive answer to Molyneux's question. First, each point on the circumference of the two-dimensional image projected by a sphere is similar to every other point, but the same is not true of the points on the perimeter of the image projected by a cube. Second, a homogeneously colored sphere projects the same two-dimensional image however it may be rotated, but a homogeneously colored cube does not. Using these clues, the newly-sighted man could know which object was the cube and which the sphere. (Leibniz makes similar points in his discussion of Molyneux's problem in the *New Essays on Human Understanding*.)

In passing on Synge's solution to Locke, Molyneux wrote, "You will easily discover by what false steps this Gentleman is lead into his error (Corr. #1984). Thus discouraged from giving a detailed response to Synge's solution, Locke replied, "I see by Mr. S's answer to that which was originally your question, how hard it is, for even ingenious men to free themselves from the anticipations of sense" (Corr. #2095). By 'the anticipations of sense,' Locke means, I think, the associative process going from initial visual impression to the final judgment of shape. It's hard to know from this exactly how he would criticize Synge's answer, had he chosen to expand his reply.

One possibility is that Locke would assert that ubiquity of the associative process had kept Synge from seeing its arbitrariness. Vision presents us with circles and irregular

hexagons, and it only by custom that we come to judge the presence of sphere and cubes. Locke would perhaps agree that if the newly sighted person were taught some of the elements of optics and projective geometry, he could figure out the answer. For that matter, the newly sighted person could figure it out if the experimenter uttered the words “the sphere is the thing on the left.” Those hypotheticals don’t refute the central point that Locke was trying to make. The connection between two-dimensional image and a judgment of three-dimensional shape is a contingent one, brought about by custom and not by reason.

3 Perception and Time

3.1 *The Perception of Succession*

Locke’s account of time perception posits an internal temporal order, running parallel to the objective one, but sometimes at a different rate. This subjective order of time appealed to Laurence Sterne, who used it to comic effect in *Tristram Shandy* and dropped an acknowledging footnote to Locke. As a result, Locke’s theory of time perception has been discussed more by Sterne’s commentators than by his own. (Kyle 1971 assembles the relevant passages in the novel.)

Locke summarizes his intricate account of the origins of temporal ideas at *Essay* 2.14.31. We get the idea of succession by reflection on our internal trains of ideas; by observing intervals in this succession, we get the idea of duration; by sensation, we get the ideas of certain measures of duration; by repeating those measures, we can imagine duration when nothing really endures; by being able to repeat the idea *ad infinitum*, we come to the idea of eternity; and finally, by considering any part of infinite duration, we come by the idea of time. For the purposes of describing Locke’s account of time perception, we should

focus on his accounts of how we acquire ideas of succession, duration, and the measures of duration.

In *Essay* 2.7, Locke classes *succession* as one of the ideas that come from sensation and reflection, though one “more constantly offered us” by reflection one’s internal series of ideas. (2.7.9). Call this ‘the broad Lockean view.’ In *Essay* 2.14, Locke argues that we get the idea of succession *only* from reflection on the succession of our ideas (2.14.3-4, 2.14.6, 2.14.31). Call this ‘the narrow Lockean view.’ As an adjunct to the narrow Lockean view, he argues in 2.14 that we get the idea of duration by reflecting on the distance between these succeeding ideas (2.14.3).

If we are willing to split interpretive hairs, we find four arguments for the narrow Lockean view in 2.14.4. The first direct argument is from sleep. We don’t perceive the lapse of time when we wake from a dreamless sleep. The best explanation for this is that we perceive duration by reflecting on the train of ideas in our minds and this train ceases during sleep. So, probably, we perceive duration by reflecting on the train of ideas in our minds.

Someone might object that when we wake from sleep, it actually does seem as if time has elapsed. If this is a genuine and immediate appearance and not inferred from some other phenomenon, it tells against both broad and narrow Lockean views. Locke’s implicit reply to this objection is that once someone has observed the regularity of days and nights, he can “imagine and make allowance for the length of *Duration*, whilst he slept” (2.14.5). Nevertheless, if Adam and Eve slept for twenty-four hours, they wouldn’t notice. The last example is akin to Aristotle’s example of sleeping Sardinian heroes (*Physics* 4.11), but Locke only draws a psychological lesson for the example. Aristotle had gone further and drew a metaphysical consequence (See Coope 2005: 37-41).

Locke's second argument relies the premise that we have a sense of duration while dreaming. The best explanation for this is that we perceive duration by reflecting on the train of ideas in our minds and this train occurs during dreams (2.14.4). So, probably, we perceive duration by reflecting on the train of ideas in our minds.

Locke's third argument appeals to the phenomenon of concentration. He writes, one who fixes his Thoughts very intently on one thing, so as to take but little notice of the succession of *Ideas* that pass in his Mind, whilst he is taken up with that earnest Contemplation, lets slip out of his Account a good part of that Duration, and thinks that time shorter than it is (2.14.4)

According to Locke, if someone focuses his attention on a single thing to the exclusion of attending the succession of ideas in his mind, then time seems to elapse more quickly than it actually does. The best explanation is that concentration distracts us from reflection, and we perceive duration by reflecting on the train of ideas in our minds. So, probably, we perceive duration by reflecting on the train of ideas in our minds.

Locke considers the objection on his account "it would be impossible . . . for a Man to think long of any one thing" (2.14.13). He replies that we can't focus on an idea so exclusively that we prevent a succession of ideas, challenging his readers to try (2.14.14).

Notice that Locke's claim is not merely that in order for us to have an opinion on the length of some passage of time we need to introspect. Rather, opinions on the lapse of time depend on reflection on our ideas, and the result of this reflection depends on the rate at which we produce ideas. From this and similar considerations, Locke concluded that the apparent passage of duration was the appearance of the passage of ideas.

Douglas Odegard argues that Locke's doctrine that we get our ideas of duration from reflecting on a train of successive ideas commits him to a theory of the 'specious

present' according to which "an idea can be both past and present at the same time. The idea does not merely persist but continues to exist after it has ceased to exist" (1978: 149). I don't think that this or anything like that follows. An entirely present idea might be produced by reflection on successively occurring ideas. Generally speaking, an effect may be entirely present at a time even though its causes occur over time, as happens when a house is built by various processes over a period of months.

As Odegard concedes (*ibid.*), his interpretation is in tension with Locke's claim that nothing exists outside of the present: "*Duration*, and of Time which is a part of it, *is the Idea* we have of *perishing distance*, of which no two parts exist together, but follow each other in Succession," so we cannot "put it together in our Thoughts, that any Being does now exist to Morrow, or possess at once more than the present moment of Duration" (2.15.12). Christopher Conn (2003: 126-33) argues that Locke is a crypto-four-dimensionalist since he sometimes refers to past existences as being united into a currently existing person. But these passages can be made compatible with *Essay* 2.15.12 by interpreting the relevant unity relation as *is, was, or will be a constituent*. Locke does imply that we can have ideas in mind for a stretch of time, for example in his account of contemplation (2.10.1), but to say that ideas endure is compatible with saying that they exist all at once.

3.2 *The Perception of Motion*

According to Locke, the idea of motion is gotten through sight and touch (2.5). This is a simple idea of sensation, and Aristotelian, Cartesian, and atomist attempts at defining motion are futile (3.4.8-9).

The problems of the specious present and of the temporal character of our ideas arise in a more pointed form for ideas of motion, since Locke declares that the idea of

motion is a resemblance of the motion in a moving body (2.8.15). His resemblance doctrines are problematic in various ways, but surely he never meant that every idea of every primary quality resembles the corresponding quality in every respect. Perhaps Locke doesn't mean to imply that our ideas of motion unspool over time in the way that worldly motions do.

A good piece of evidence for this may be found in the opening of *Essay* 2.14.28, where Locke writes, "The notion of an Hour, Day, or Year, being only the *Idea* I have of the length of certain periodical regular Motions, neither of which Motions do ever all at once exist, but only in the *Ideas* I have in my Memory derived from my Senses or Reflection." The plain implication of the passage is that motions don't exist all at once and that ideas of motion do.

Locke attacks the view that we get the idea of duration from observing moving bodies. The heart of the attack is his observation that we can perceive succession without perceiving motion:

But where-ever a Man is, with all things at rest about him, without perceiving any Motion at all; if during this hour of quiet he has been thinking, we will perceive the various *Ideas* of his own Thought in his own Mind, appearing one after another, and thereby observe and find succession, where he could observe no Motion. (2.14.6)

This example is similar to one that Aristotle offers for what superficially appears to be the opposite conclusion: "Now we perceive movement and time together; for even when it is dark and we are not being affected through the body, if any movement takes place in the mind we at once suppose that some time has indeed elapsed" (*Physics* 219a4-6). The difference rests on Aristotle's broader notion of 'movement.' Something may 'move' in

Aristotle's sense by changing with respect to place, quantity, or quality (*Physics* 192b15, 225b5-9; Coope 2005: 51).

Locke explains away the fact that we sometimes perceive succession when we perceive motion by asserting that whenever we perceive motion, "Motion produces in his Mind an *Idea* of Succession, no otherwise than as it produces there a continued train of distinguishable *Ideas*" (2.14.6). Still, a problem remains, I think. Consider Locke's thesis that the motion of the heavenly bodies makes for an appropriate measure of time. The daily and annual motions of the sun are "constant, regular, and universally observable by all Mankind, and supposed equal to one another" (2.14.19). Thus, they "have been with Reason *made use of for the measure of Duration*" (2.14.19). Why should the motion of the sun be an appropriate measure of duration but not an appropriate source of the idea of duration?

Part of the answer is that the sun moves so slowly that Locke denies that it immediately produces a perceptible idea of motion (2.14.6). He also denied that we see the motion of the hands of clocks and the shadows of sundials (2.14.11). This isn't a complete solution. First, one might think that any perceptible motion, no matter how irregular, should suffice to give us some idea of temporal succession. Second, Locke knew about pendulums, and he knew that their periods were apparently regular. Indeed, both his journals in France (Locke 1953: 160, 185, 253, 259, 261) and his proposed system of measurement at footnote (a) of *Essay* 4.10.10 reveal an interest in using the regularity of the pendulum as an aid to accurate, objective, and internationally useful measurements.

I propose that Locke didn't want to multiply subjective perceptions of time. As we have seen, he believed that the rate at which time appears to pass is determined by the contents and the activities of the mind. He assumes that if those contents and activities directly determine the apparent lapse of time, then nothing else directly determines the

apparent lapse of time, including the sight of motion. This helps explain Locke's dismissive remarks about the use of a pendulum as the ultimate standard of time:

though Men have of late made use of a Pendulum, as a more steady and regular Motion, than that of the Sun or (to speak more truly) of the Earth; yet if any one should be asked how he certainly knows, that the two successive swings of a Pendulum are equal, it would be very hard to satisfy himself, that they are infallibly so: since we cannot be sure, that the Cause of that Motion which is unknown to us, shall always operate equally; and we are sure, that the Medium in which the Pendulum moves, is not constantly the same All that we can do for a measure of Time, is to take such as have continual successive Appearances at seemingly equidistant Periods; *of which seeming Equality, we have no other measure, but such as the train of our own Ideas* have lodged in our Memories, with the concurrence of other probable Reasons, to persuade us of their Equality (2.14.21).

Locke can't be absolutely sure that the periods of a pendulum are objectively equal, since he doesn't know the causes of its apparent regularity. All he can do is say that its motions appear to occur at regular intervals. But apparent duration is not the idea of duration that looking at a pendulum causes in us; instead, it's the appearance of duration produced in us by reflection on the train of ideas which we have while looking at a pendulum. The second phenomenon drives out the possibility of the first. This explains why, for Locke, "*the constant and regular Succession of Ideas in a waking Man, is, as it were, the Measure and Standard, of all other Successions*?" (2.14.12).

Locke believes that we only perceive motion when we have ideas of the object changing its position relative to something else. Thus, someone on a boat on a calm sea

won't see motion in sea, ship, or sun over an hour, even though at least two of them have moved in the interim. As soon as he perceives one of them to change distance with respect to some other body, he perceives motion (2.14.6). We can't perceive very slow motions because the change of ideas that they produce in us comes a long time after the first idea (2.14.7). We can't perceive very fast motions because they don't produce a train of ideas in us, e.g., a body that moves rapidly in a circle (2.14.8).

Acting on this premise, Locke infers that we may treat the perception of motion as a useful proxy for thinking about the succession of ideas in our minds. He suggests that the rate of succession of our ideas has upper and lower limits. A bullet goes too fast to produce successive ideas (2.14.10) and a clock hand goes too slow (2.14.11).

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