9

Answering Molyneux

In general form William Molyneux’s famous question to Locke asks whether a blind subject (call him “S”) whose sight is newly restored will be able to distinguish between and identify a sphere and a cube presented to her at a distance outside of her grasp. Much has been written about this question, but the question’s ambiguity is greater even than its publicity.

I propose to identify Reid’s answers to Molyneux’s questions and draw out implications of his response for his theory of perception. If Gareth Evans is right, Reid’s answer is unique in the history of philosophy (Evans 1985, 393–4). In his “Molyneux’s Question,” Evans begat interest in Reid’s response by claiming that Reid stands out as the philosopher who thought most highly of our cross-modal perceptual abilities, and who gives the strongest “yes” answer (i.e. “yes, the formerly blind subject can discriminate between spheres and cubes in her visual field”). Though Evans quotes Reid, his interests are not historical in nature and he does not take steps to develop Reid’s actual analysis of this problem. This is the task before us.

The major difficulty facing any interpretation of Reid on Molyneux’s question is that he addresses the Molyneux problem on three distinct occasions and he gives opposite answers at different places in the same book (first a “no”, then two “yes” answers). This disregard for his readers has led some to argue, understandably, that his account is inconsistent (Davis 1960, 403–4). Yet a careful reading of his texts, coupled with an understanding of the different forms of Molyneux’s question circulating in Reid’s milieu, will aid in resolving the confusion.

Reid requires great specificity in the question prior to offering any definitive answer—specificity absent in the historical treatment of the question. Depending on how it is qualified, Reid may answer “yes,” “no,” or “maybe.” The apparent vacillation in Reid’s analysis of the problem can be explained by the cautiousness called for by his Newtonian method. In the following discussion I’ll attempt to show that Reid’s aim is to continue to build his case against the Ideal Theory, which he does by eliminating the necessity of sensations for the perception of visible figure and shape.
9.1. Historical Ambiguity

The ways in which Early Modern philosophers rephrase Molyneux’s question tells us as much about their philosophy of perception and views about concept acquisition as do the ways they answer the question they rephrase. (To be clear, “Molyneux’s” question is asked by one philosopher to another, whereas “cube/sphere” questions are asked of newly sighted subjects.) It is beyond the scope of this chapter to detail the ways the question was formed in Reid’s milieu, though Table 2 contains a condensed version of the intriguing differences in historical forms of the question. Here I will identify Molyneux’s original statements of the question and then advance to Reid.

Molyneux wrote to Locke twice about the problems encountered by a congenitally blind man in arriving at spatial concepts. The first letter was written on July 7, 1688, the second on March 2, 1693. Consider the relevant passage of the first:

A Man, being born blind, and having a Globe and a Cube, nigh of the same bignes, Committed into his Hands, and being taught or Told, which is Called the Globe, and which the Cube, so as easily to distinguish them by his Touch or Feeling; Then both being taken from Him, and Laid on a Table, Let us suppose his Sight Restored to Him; Whether he Could, by his sight, and before he touch them, know which is the Globe and which the Cube? Or Whether he could know by his sight, before he strechd out his Hand, whether he Could not Reach them, tho they were Removed 20 or 1000 feet from him? (Locke 1976–89 iii, 482–3; no. 1064)

Molyneux poses two questions here. In the first he imposes one constraint: that the subject be made to answer which object is the globe and which the cube “before he touch them.” The subject presumably may perform other actions—pass his hand before his eyes, say—before answering. This question is typically known as the Molyneux question and can be stated as:

(9.1) Could the subject know, by sight and prior to touching the objects, which is the cube and which the globe?

The second of his two 1688 questions is about distance perception:

(9.2) Could the subject know, by sight, prior to touching the objects, and prior even to passing his hand through his visual field, whether the cube and globe are within his grasp?

Molyneux does not inquire whether the subject knows how distant the objects are. Rather, assuming the objects are placed “20 or 1000 feet” away from the subject, he could know that they are placed at some distance or other from his eye, as presumably opposed to the thought that the
objects might be "seen" as impinging upon the very surface of the eye. (9.2) can be made interesting in its own right, but in Molyneux's letter the question is not especially well-formed. Few people have examined the issue of distance perception qua Molyneux's question because most believed that the answer was clearly "no." In part this is because it is difficult to determine the full angular range of one's arms, and even more difficult to use that information in conjunction with visible figures to answer to (9.2). Reid is perhaps an exception for he does discuss (9.2), though he too is more concerned with (9.1).

The distinct philosophical interest of (9.1) over (9.2) is why Locke chose to publish a quotation from Molyneux's 1693 letter, which restates (9.1) and avoids mention of (9.2). Molyneux's 1693 question asks:

Suppose a Man born blind, and now adult, and taught by his Touch to Distinguish between a Cube and a Sphere (Suppose) of Ivory, nighly of the same Bignes, so as to tel, when he felt One and tother, Which is the Cube which the Sphære. Suppose then, the Cube and Sphere placed on a Table, and the Blind man to be made to see. Quære whether by his sight, before he touchd them, he could now Distinguish and tel which is the Globe which the Cube. I answer, Not; for tho he has obtaind the Experience of How a Globe, how a Cube affects his Touch. Yet he has not yet attaind the Experience, that what affects my Touch so or so, must affect my Sight so or so. (Locke 1976–89 iv, 631: no. 1609, March 2, 1693)

Locke reproduces this in his essay with only cosmetic differences (1975, 2.9.8/146). This question can be stated as:

(9.3) Could the subject distinguish, by sight and prior to touching the objects, which is the cube and which the globe?

The differences in the 1693 letter are, first, that Molyneux asks whether the subject "could now" distinguish the globe from the cube. Strictly speaking, even the odd "yes" response is qualified by saying that the subject must be given a few moments to orient his visual perceptions. But this requirement can also be seen as a way to preclude the subject's use of reasoning once he is given sight, for using reason might require that the subject pause and reflect on the

¹ Molyneux's own "no" answer to (9.2) was to have a profound effect on Berkeley and others. In his Dioptrica Nova Molyneux says: "In Plain Vision the Estimate we make of the Distance of Objects (especially when so far removed, that the Interval between our two Eyes, bears no sensible Proportion thereto; or when look'd upon with one Eye only) is rather the Act of our Judgment, than of Sense; and acquired by Exercise and a Faculty of comparing, rather than Natural. ... For Distance of it self, is not to be perceived; for 'tis a Line (or a Length) presented to our Eye with its End towards us, which must therefore be only a Point, and that is Invisible" (Molyneux 1692, 113).
answer. I refer to this form of reasoning as “abstract” rather than “a priori” because it requires the use of data given in experience, even though the relevant data is not given to the subject in his experience. Second, in the 1688, letter Molyneux asks epistemic questions, using “know” in his statements of what I have paraphrased as (9.1) and (9.2). These qualifications make it both more difficult and more easy for the subject to answer the cube/sphere question: more difficult, because the response must directly follow the operation without time to adjust, but more easy because merely distinguishing between the cube and sphere is a less burdensome cognitive demand than is knowing which is the cube and which the sphere. Notice I am not claiming that Molyneux intended to ask different questions in 1688 and 1693, but rather that he did ask different questions.

Locke restates (9.3) and provides his answer as follows: “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” (Locke 1975, 2.9.8/146). From this answer we can see he is asking a slightly different question than (9.3). He seems to have answered something like (9.4):

(9.4) Supposing that there is nothing else in his visual field, could the subject know with certainty and immediately, by sight and prior to touching the objects, which is the cube and which the globe?

(9.4) captures several of the constraints that Locke imputes into the question: the subject must answer immediately (“at first sight”) and “with certainty,” and, seemingly, there must be nothing else in his visual field (insofar as that proves possible).

The question is typically taken to be philosophical rather than empirical. In other words, the phrase “could the subject tell” typically refers to what it is conceptually possible for the subject to know. However, experimental results were taken to confirm the negative answer. William Cheselden removed cataracts from a fourteen-year-old boy in 1728, which offered an opportunity to supplement answers to the philosophical forms of the question with answers to empirical forms of the question. Cheselden reports in Philosophical Transactions in 1728 (reprinted in Degenaar 1996) that his patient failed visually to recognize his cat upon being given sight. This “young Gentleman…when he first saw…was so far from making any Judgement about Distances, that he thought all Objects whatever touch’d his Eyes” (Degenaar 1996, 55). Most philosophers addressing the question in the century after Cheselden’s surgery address this experiment in some way.
Berkeley makes heavy use of this result, but to uncertain effect. In *Theory of Vision Vindicated* Berkeley summarizes the Cheselden case incompletely and inaccurately, then concludes: “Thus, by fact and experiment, those points of the theory which seem the most remote from common apprehension were not a little confirmed, many years after I had been led into the discovery of them by reasoning” (TVV §71/WGB i, 276). On the contrary, despite the amusing story about the boy’s cat with which Cheselden flavors his lab report, this case throws little light on the Molyneux question. The boy was not congenitally blind. He had lost his sight as a young child, though at just what age we do not know. Cheselden only repaired one eye at a time. There were months between the two operations. This would be relevant since binocular vision may figure prominently in answering Molyneux from purely physiological data. At least, were the boy to answer a cube/sphere question negatively with one functioning eye, such a response would not provide an adequate ruling upon the philosophical question. If he were to answer after both eyes are functioning, this would also be inadequate since this gives the boy time to associate in experience his monocular experiences of visible figures with his tactile sensations. Furthermore, Cheselden did not ask his patient any of Molyneux’s questions. It is unlikely Cheselden even knew of Molyneux’s question(s) at the time. Natural philosophers, including Cheselden, were keenly interested in the visual acuity of the patients after the operation but, without an adequate experimental environment, even the empirical form of Molyneux’s question could not be ruled upon. Besides, were such a patient to answer “no” under the most favorable of circumstances, even this would not show that it is not conceptually possible for some human being or other to distinguish the cube from the sphere.

Unfortunately, questions about the logical status and modal scope of the questions were rarely if ever addressed. Condillac is the exception. He must have Berkeley in mind in the *Treatise* when he says, of philosophers addressing Molyneux’s problem: “We set forth the question poorly, we do not even know how to set it forth, and yet we claim to have resolved it” (Condillac 1982, 3.3/277. See his detailed recommendations on what went wrong in Cheselden’s case and on how to create ideal conditions for observation for a patient after the removal of cataracts in Condillac 1982, 3.5–3.6/290–5).

Together, Molyneux and Locke came to set the standard conditions upon which the question can be posed and answered in such a way as to yield important philosophical results. Cheselden’s conditions were taken by Berkeley
to be such conditions, but they were not. What I will call the “standard conditions” under which a Molyneux question is posed are these. The subject has been blind since birth and has his sight restored in both eyes simultaneously. The subject answers the question only by seeing, and not touching, the objects. Objects are set at a distance far enough from the eyes to allow the subject to focus on both at once, but near enough that people with normal sight would answer “yes.” The objects must be of a similar size. The question asks the subject to determine which object is the cube (or square) and which is the sphere (or circle). An unstated ceteris paribus clause filters aberrant and unforeseen features of the subject, the perceptual environment, and the question.

This is not to say that there were not other conditions that individual philosophers placed upon the question. Reid’s treatment of the problem was shaped by the twists put upon the question by his predecessors (see Table 2).

Table 2: Responses to Molyneux’s Questions

All the major players differ in their statement of the problem itself, their understanding of the implications of the problem, and/or in their answers to Molyneux’s original question(s). Even when there is apparent unanimity on a “no” answer, as with Locke and Berkeley, the arguments they each give on its behalf are not only different but, in that case, mutually incompatible (Park 1969).

I must clarify some assumptions about the questions. One assumption present in the standard conditions is that the subject is capable of taking seen visible figures as intentional objects of perceptual belief. Berkeley does not assume that the subject has discrete visual figures or color patches as the intentional objects of those first perceptual states. For Berkeley, the subject’s visual perception resembles the visual experience of infants who, in an evocative phrase from William James, experience “a blooming, buzzing confusion.” Infants, he says, “must go through a long education of the eye and ear before they can perceive the realities which adults perceive” (James 1981, 724). For Berkeley, the subject will not misidentify the cube as the sphere; rather, there are no determinate figures in his field of vision that could stand as the intentional objects of perceptual beliefs. Rich perceptual experience is needed even to have intentionally directed visual perception of two-dimensional visible figures.

This assumption drives only Berkeley’s radical perspective on the question. In effect, determining the nature of the subject’s visual experience is an empirical matter. If research on the visual capacities of neonates is any guide,
### Table 2. Responses to Molyneux's Questions

<table>
<thead>
<tr>
<th>Molyneux</th>
<th>Locke</th>
<th>Berkeley</th>
<th>Leibniz</th>
<th>Condillac</th>
<th>Diderot</th>
<th>Reid</th>
</tr>
</thead>
<tbody>
<tr>
<td>1688</td>
<td>a</td>
<td>1688</td>
<td>a</td>
<td>b</td>
<td>1693</td>
<td>1693</td>
</tr>
</tbody>
</table>

1. Berkeley's preferred version of the question is this: "a man born blind would not at first reception of his sight think the objects of touch, or anything in common with them. (NTV § 128/WGB I, 223). With his "no" answer Berkeley allies himself with the idea that there is no inter-modal sharing of information. The subject would believe the question is "downright bantering and unintelligible" (NTV § 135/WGB I, 226).

2. Leibniz says: "by applying rational principles to the sensory knowledge which he has already acquired by touch," the agent will be able to distinguish them. The subject can determine which figure is of the cube and which is of the sphere because "in the case of the sphere there are no distinguished points on the surface of the sphere taken in itself, since everything there is uniform and without angles, whereas in the case of the cube there are eight points which make the angles" (Leibniz 1981, 136–7, 29).

3. Condillac's discussion of Molyneux-like problems is so rewarding it cannot be adequately summarized in a note. Also, the column for Condillac is misleading insofar as he does not address himself to Molyneux's questions. He describes what his statue would experience, given his wealth of reflective knowledge, once sight is added to touch. Then he separately analyzes cases of the removal of cataracts. First, having undergone surgery for the removal of cataracts,觉悟者 require time to adjust to the experience of light and color. Patience being a symbol for the removal of carnal experiences. And color, he declares, is "the first impression of the mind" (Condillac 1982, 294–5).

4. Diderot was the first to recognize that to require of the subject that he see a three-dimensional cube and three-dimensional sphere unnecessarily burdens a "yes" answer by making it depend upon a form of depth perception. Someone with newly restored sight might be capable of distinguishing a two-dimensional, four-sided figure from a two-dimensional, circular figure, and yet be incapable of doing the same for cubes and spheres. So, if one wishes to ascertain cross-modal perceptual abilities, then posing the question about squares and circles is a more efficient way of achieving that end.
Evans uses the Molyneux problem as a means to test S’s concept acquisition operationally. Evans implies that to know one is presented with a square visual array is to be disposed to reach in certain ways. He says: “no explanation can be given of what it is to have a perceptual representation of space—to be given perceptually the information that objects of such-and-such a character are arranged in such-and-such a way in one’s vicinity—except in terms of the behavioural propensities and dispositions to which such information gives rise” (Evans 1985, 371). From this he mounts what seems to me to be a transcendental argument about the necessary structure of experience in our spatial behavioral framework to the effect that it must be profoundly unitary. He concludes that “it is not possible to have a conception of an objective world—a world whose states and constituents are independent of one’s perception of them—without conceiving of that world as spatial, with oneself as located within it and tracing a continuous path through it” (Evans 1985, 369; see Cassam 1997, Chapters 2 and 3).

Evans and Reid both return strong “yes” answers, but Evans’ response appeals to the status of S’s “behavioral framework.” Evans’ answer marks a stronger “yes” than either Leibniz’s or Reid’s because Evans’ appeal to the structure of the manifold of human experience lends itself to an interpretation on which it is necessarily the case that the subject will know a cube from a sphere under Molyneux’s conditions. Neither Reid nor Leibniz would be comfortable with that way of putting the point.

<table>
<thead>
<tr>
<th>S’s perception has intentional content</th>
<th>Molyneux 1688a</th>
<th>Molyneux 1688b</th>
<th>Molyneux 1693</th>
<th>Locke</th>
<th>Berkeley</th>
<th>Leibniz</th>
<th>Condillac</th>
<th>Diderot</th>
<th>Reid (Cheselden’s boy)</th>
<th>Reid (Saunderson)</th>
<th>Evans⁶</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGENT</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>S is totally passive, e.g.</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>D</td>
<td>A</td>
<td>D</td>
<td>D</td>
<td>?</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>S employs reasoning</td>
<td>A</td>
<td>A</td>
<td>D~</td>
<td>D</td>
<td>A</td>
<td>A</td>
<td>D</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JUDGMENT</td>
<td>Visual perception of depth required for “yes”</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>D</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance question (“whether he could not reach them”)</td>
<td>A</td>
<td>A</td>
<td>D</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

⁶ Evans uses the Molyneux problem as a means to test S’s concept acquisition operationally. Evans implies that to know one is presented with a square visual array is to be disposed to reach in certain ways. He says: “no explanation can be given of what it is to have a perceptual representation of space—to be given perceptually the information that objects of such-and-such a character are arranged in such-and-such a way in one’s vicinity—except in terms of the behavioural propensities and dispositions to which such information gives rise” (Evans 1985, 371). From this he mounts what seems to me to be a transcendental argument about the necessary structure of experience in our spatial behavioral framework to the effect that it must be profoundly unitary. He concludes that “it is not possible to have a conception of an objective world—a world whose states and constituents are independent of one’s perception of them—without conceiving of that world as spatial, with oneself as located within it and tracing a continuous path through it” (Evans 1985, 369; see Cassam 1997, Chapters 2 and 3).
<table>
<thead>
<tr>
<th>S asked whether S</th>
<th>A</th>
<th>A*</th>
<th>A</th>
<th>?</th>
<th>A*</th>
</tr>
</thead>
<tbody>
<tr>
<td>'knows' which is</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>which</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S asked to answer</th>
<th>A</th>
<th>A</th>
<th>D</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>immediately</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OBJECTS**

<table>
<thead>
<tr>
<th>Q posed about cube</th>
<th>A</th>
<th>A</th>
<th>A</th>
<th>A</th>
<th>A</th>
<th>A</th>
<th>A</th>
<th>D</th>
<th>A</th>
<th>A?</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>and sphere</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q posed about</th>
<th>A</th>
<th>A</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>square and circle</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| No other objects in | A | A |
| visual field        |   |   |

**ANSWER**

<table>
<thead>
<tr>
<th>No</th>
<th>No</th>
<th>No</th>
<th>No</th>
<th>□</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>□</th>
</tr>
</thead>
</table>

---

S = agrees; D = disagrees; ? = response uncertain in text or too complex to be represented with "A" or "D"; □ = conceptually necessary. Blank cells indicate that the author did not address the point.

- Condillac requires that S is passive in the sense that he not move his hands through his visual field, but he requires that S is active in the sense that S must be allowed to learn to "look" as opposed to "see." "In a word, our eyes must analyze" (Treatise 3.3.6, Condillac 1982, 276).

- Diderot poses the question to several different people, a "dullard," a "metaphysician," and a "geometer." The metaphysician and geometer both give "confident" affirmative answers to square/circle questions. The geometer does not use a priori reasoning, but uses abstract reasoning through which tactile experience is compared with visual experience (Diderot 1972, 134–6).

- The second form in which Reid poses the question requires that S employ not merely abstract reasoning, but advanced geometrical and spatial reasoning.

- Locke and Evans both place the epistemic bar high. Locke asks whether S knows "with certainty" which is which.

- Leibniz requires that there are no objects in S's visual field, and that S knows that there are no other objects in S's visual field.
then Berkeley is incorrect. But even if this research prima facie indicates that Berkeley’s analysis of visual experience is wrong, there are at least some cases in which it is correct. When restricted to those with damage to or a deterioration of their visual cortex, Berkeley’s claim is probably correct. But I will be assuming, with Reid, that the subjects of whom we speak have a functional visual cortex, optic nerve, and eyes. This is my second assumption.

This qualification raises an important point about quantifying over the set of subjects involved. These questions are posed to a theoretical subject, who is intended to represent everyone in such circumstances, but some people will have cerebral damage or impaired conceptual abilities from which would follow aberrant answers. Someone might think, of subjects to whom Molyneux’s questions are posed, that (a) all of them are incapable of distinguishing a cube from a globe (or a square from a circle); that (b) some of them are capable, and some incapable, of distinguishing a cube from a globe; or that (c) all of them are capable of distinguishing a cube from a globe. Evans’s appeal to quasi-transcendental considerations indicates that he might endorse a universally generalized answer like (c). Of their respective formulations of the question, Locke, Molyneux, and Berkeley answer with (a); indeed, one might argue that Berkeley takes (a) to be a necessary truth. A stance on this scope issue may imply an analysis of the implicit modal operator in several forms of the question. Most respondents offer universally generalized answers intended to range over all properly functioning perceivers, but this is a methodological assumption Reid does not share.

9.2. Cheselden’s Boy: “No”

Reid first discusses blindness and distance perception at Inquiry 6.3. The discussion is primarily about the distance issue in (9.2), and it occurs in the context of his analysis of visible figure and the visible appearance of objects. The reason that this discussion intermingles with a discussion of visible figure is that the immediate object of visual experience for the subject, when the blindfolds are removed, is a seen visible figure (see Section 4.4). However, in the midst of this discussion, Reid also addresses object-identification issues. At this point he fails to distinguish clearly between the two points.

---

The text includes a footnote regarding the perception of neonates and its relevance to cross-modal perception. The footnote reads:

Footnote: Sight in neonates has received attention by psychologists interested in determining spatial perception skills, the onset of cross-modal perception, and other features of early perceptual learning. They have concluded that newborns exhibit abilities that can be best explained by hypothesizing that their various sense modalities are capable of sharing perceptual information in a matter of hours from birth. Thus very young infants “register the same information about the shape of the object even if it is picked up through two different modalities, touch and vision” (Meltzoff and Moore 1993, 224).
Reid makes the general point that we err in believing that we can ascertain distance via sight alone. As we know from our study of visible figure, “it is certain that visible appearance hath no more than two [dimensions], and can be exactly represented upon a canvass which hath only length and breadth.” Reid adds: “it appears certain, that distance from the eye is no immediate object of sight” (IHM 6.3, 84/136b). In the *Intellectual Powers* Reid says: “The objects which we see naturally and originally... have length and breadth, but no thickness, nor distance from the eye” (IHM 6.20, 167/182a). So long as the objects between which the subject must discriminate are three-dimensional, the subject must possess the concept of depth in order to answer affirmatively. To acquire the concept of depth, one must have tactile sensations. This is the result of what we have learned both about Reid’s explanation of the origins of primary qualities and about his qualified claim that tactile sensations are physically necessary for the perception of some primary qualities. An alternative way of putting this point is to emphasize an observation made in the previous chapter—namely that distance is an object of acquired perception and is not original to vision (see also Hopkins 2005, 343).

Reid emphasizes the implications of the two-dimensionality of visible figure with his thought experiment about the “Idomenians”—creatures “endued with sight only, without any other external sense.” An Idomenian would be incapable of arriving at a concept of distance. “We must not conceive him disposed by his constitution, as we are, to consider the visible appearance as a sign of something else” (IHM 6.9, 106/149a). Reid adds: “He might perceive visible objects to have length and breadth, but could have no notion of a third dimension, any more than we can have of a fourth....It would not be possible for him to conceive one object to be behind another, or one to be nearer, another more distant” (IHM 6.9, 106–7/149a). This treatment of question (9.2) is idealized and the product of a thought experiment, but Reid explicitly addresses (9.2) in the following passage.

[D]oes not every man, by sight, perceive the distance of the book from his eye?...[I]t appears certain, that distance from the eye is no immediate object of sight. There are certain things in the visible appearance, which are signs of distance from the eye, and from which, as we shall afterwards shew, we learn by experience to judge of that distance within certain limits; but it seems beyond doubt, that a man born blind, and suddenly made to see, could form no judgment at first of the distance of the objects which he saw. The young man couch’d by Cheselden thought, at first, that everything he saw touched his eye, and learned only by experience to judge of the distance of visible objects. ... To a man newly made to see, the visible appearance of objects would be the same as to us; but he would see nothing at all of their real dimensions, as we do. He could form no conjecture, by means of his sight only, how many inches or
feet they were in length, breadth, or thickness. He could perceive little or nothing of
their real figure; nor could he discern that this was a cube, that a sphere; that this was a
cone, and that a cylinder. His eye could not inform him that this object was near, and

In the first part of this passage Reid wants to know the means by which one is
able to perceive the approximate metric distance of an object like a book from
oneself. But in the second part he addresses the thickness of objects and discusses
the perception of different three-dimensional objects. Reid thereby seems to
conflate two distinct issues in the visual perception of all three dimensions. For
his part, when saying that we cannot visually perceive depth, he means that
we cannot perceive the distance an object is from an eye and that we cannot
perceive objects as inhabiting a dimension extending at angles out from the eye.

Reid is not alone in overlooking this ambiguity. On one hand is the visual
perception of metric distance of an object from the eye and visual perception of
relative distance between two objects (distinct issues we will conjoin for now).
On the other is the visual perception of the depth or metric depth of objects
themselves. To describe the two types of visual perception in this second
group, the subject may see the book as possessing three, and not merely two,
dimensions, and the subject may see the book as being about 5’ × 8’ × 2’. In the
present context these distinct issues can be conflated without serious concern
provided we are explicit that in both kinds of case the subject must possess and
apply the subject’s concept of the third dimension, of “outness,” as Berkeley
called it. To see the book as being about 20 feet in front of me, and to see it as
being thicker than my forearm, both require an application of a depth concept.

In order to interpret this passage appropriately, we need to identify which
question it is that Reid is addressing. He evinces an interest in the cube/sphere
question. Depth cues would only be useful in a response to it, not to the
circle/square question. Reid holds that the boy of Cheselden’s experiment
could not know whether the cube and globe are within his grasp. Why?

First, it seems that we do perceive distances (of both sorts) through vis-
ion. The application of depth concepts to our visual perceptions becomes
a habituated perception for properly functioning agents, but Reid is tacitly
speaking of original perceptions here. These habitual perceptions depend upon
cross-modal coordination with touch. I observed Reid to say in a manuscript
that “The habit of judging of small distances by the eye is got so early and so
much confirmed by daily experience that it resembles original perception very
much, it is called perception in common language and can be distinguished
from original perception only by philosophers.” But he adds that he calls it
“acquired perception to distinguish it on the one hand from original percep-
tion and on the other [from] conclusions drawn by reasoning from what we
perceive” (Aberdeen MS 2132 7/V/26, 2). To employ concepts of distance in acquired perceptual beliefs, one must make use of information derivative of sight and touch. This results in Reid’s “no” to (9.2) (see Daniels 1989 and Ganson 1999 on distance perception in Reid).

In the last two sentences of the passage Reid gives us his definitive answer. Though the subject’s awareness of visible appearances and visible figures are identical to ours, the subject cannot see them as mind-independent, three-dimensional objects because he lacks concepts of depth. This can be expressed using Reid’s terminology by saying that a visible figure of a book suggests to me the presence of a book, but such suggestion relations are absent from the subject’s experience. Merely through exposure to the visible figures of cubes and spheres, the subject is unable to distinguish which is the cube and which the sphere. Strictly speaking, the subject does not perceive cubes and spheres at all, even though Reid says that his perceptual experience does contain intentional content. Note that in this discussion Reid does not remark upon the subject’s abilities to perceive two-dimensional figures.

For the sake of completeness, we can formulate Reid’s version of the question as discussed in this context as:

(9.5) Could a subject who does not employ abstract reasoning before or immediately after having his vision restored, prior to touching the objects, perceive and distinguish between a three-dimensional cube and a globe?

I use the term “perceive” in the question in order to indicate that Reid seems to assume in this context that the subject needs to be able to perceive the objects in his visual field as being a cube and a sphere in order to answer affirmatively. (This reflects the importance of the first line in the “judgment” category on the table regarding whether visual perception of depth is required for a “yes” answer.) I also explicitly describe the cube and sphere as being “three-dimensional” to capture the fact that in Inquiry 6.3 Reid explicitly considers the relevance of their “thickness” to an answer to Molyneux’s question. Once he rejects these assumptions and adopts a more lax reading of the question, the answer changes.

9.3. Saunderson and the Cube/Sphere Question: “Yes”

Upon having his vision restored, Cheselden’s patient is unable to perceive depth and is unable to determine which is the cube and which the globe. But not only does Reid refrain from generalizing this result as applying to
all human beings in such circumstances, he discusses another case in which
a subject answers affirmatively to one of Molyneux's questions. This is pos-
sible when the person of whom the question is asked is changed from an
inexperienced boy to Cambridge University's Lucasian Professor of Math-
ematics. Reid imagines it is the blind mathematician Nicholas Saunderson,
whom Reid met on his travels to England as a young man, whose sight
is restored. Rather, Reid imagines an idealized agent who possesses all of
Saunderson's skills and more, and who is blind from birth; I will use "Saun-
derson" to refer to Reid's idealization of Saunderson. In this section I want to
examine the stage of the process by which Reid says Saunderson can give a
"Yes" answer.

Reid brings Saunderson into the discussion of the Molyneux problem in
two different contexts. In the first and more oblique, the subject of this section,
Saunderson's facility in deriving geometrical visible figures of objects is used to
draw a conclusion about his capacity to answer Molyneux's question as posed
about cubes and spheres. In the second and more pointed context (assessed in
the next section), Reid discusses Saunderson's response to a question about
squares and circles.

The switch of subject from a boy to Saunderson carries particular importance
as a result of the discussion of visible figure in Chapter 5. Reid attests that visible
figure and real figure are interderivable. By knowing the real dimensions of a
figure and the distance of it from a given set of coordinates, an expert geometer,
though congenitally blind, could exactly calculate what the appearance of that
object would be as modeled from those coordinates. The figure that a blind
mathematician would come to know would not, of course, be what we have
called seen visible figure, the apprehension of which requires a functioning
visual system. But the blind mathematician would be able to calculate the
dimensions of the geometrical visible figure and model how the object would
appear to the eye when set at a particular distance.

Of course, before a blind person can come to such rich concepts, he must
have more rudimentary geometrical concepts. Reid believes that Saunderson
has a number of geometrical concepts, including concepts needed to build
Euclidean figures—foremost among them "point" and "line". The justifica-
tion for this belief is based upon Reid's observation of Saunderson's extensive
mathematical and geometrical knowledge. First, if presented with ropes fash-
ioned into squares, circles, rhombuses, etc., Saunderson will correctly identify
those shapes by touching and tracing each length of rope with his hands.
Second, many concepts in geometry—the most important—are defined in
terms of points, which are non-spatial. On this front, the abilities of the sighted
and of the blind are on a par.
Reid prepares the way for this intermediate conclusion with his earlier remarks about the Idomenians. That discussion occurs in the context of his development of his geometry of visibles. In a version of that discussion Reid presented to the Aberdeen Philosophical Society, he explicitly describes the geometrical concepts he believes the Idomenians, unfeeling seers, can acquire. Imagine that the Idomenians are presented with white circles of different sizes and distances from them, and that some circles are divided by lines. Reid says that “by comparing the objects of sight & reasoning upon them, he might by degrees acquire the idea of points, angles, right obtuse & acute, of lines straight & curved, & of spaces bounded by lines; he might discover the relations of these & form Geometrical conclusions built upon self evident principles” (Reid 1997, 273; see IHM 108/150a). A sense of touch is not necessary to acquire these geometrical concepts. The last one—space bounded by lines—is especially important for answering Molyneux’s questions.

Once Reid allows Saunderson these concepts, the second stage of the process by which Saunderson can conceive of visible figures involves the conception of Euclidean planar figures. Since Saunderson knows the geometrical definition of a triangle, he can make a mental model of its shape. A triangle is simply a figure composed of three straight lines enclosing a space. Reid is silent on whether this requires use of knowledge Saunderson has gained from touch—perhaps Reid would go so far as to say that an unseeing and unfeeling agent can conceive of a mental model of a triangle (see below). But in Saunderson’s case, he has the help of his hands and can trace out a triangle in space.

At the third stage, Reid describes Saunderson’s use of Reid’s model for his geometry of visibles:

The visible figure, magnitude, and position, may, by mathematical reasoning, be deduced from the real. ... [W]e may venture to affirm, that a man born blind, if he were instructed in mathematics, would be able to determine the visible figure of a body, when its real figure, distance, and position, are given. Dr Saunderson understood the projection of the sphere, and perspective. Now, I require no more knowledge in a blind man, in order to his being able to determine the visible figure of bodies, than that he can project the outline of a given body, upon the surface of a hollow sphere, whose centre is in the eye ...

A blind man can conceive lines drawn from every point of the object to the centre of the eye, making angles. He can conceive that the length of the object will appear greater or less, in proportion to the angle which it subtends at the eye; and that, in like manner, the breadth, and in general the distance, of any one point will appear greater or less, in proportion to the angles which those distances subtend. He can easily be made to conceive, that the visible appearance has no thickness ... He may be informed, that the eye, until it is aided by experience, does not represent one object
as nearer or more remote than another. Indeed, he would probably conjecture this of himself. (IHM 6.7, 95–6/142b–143a)

Imagine an idealized blind mathematician possessing these reasoning skills to be given sight. Reid’s guiding thought is that such a subject will be able through abstract reasoning to compare the geometrical properties of visible figures of cubes that he has in his mind’s eye with the two two-dimensional visible figures that now appear in his field of vision. The geometry of visibles ranges over two- and three-dimensional objects; in other words, blind Saunderson can calculate the geometrical visible figures of plane circles and three-dimensional spheres on a couple of conditions. He must be provided with their dimensions, their distance from the eye, and their angle of orientation to the eye (IHM 6.7, 96/143a). (This data is not necessary in order for Saunderson to answer affirmatively.) Also, the objects must be sufficiently different so that they cannot project identical visible figures to the same set of coordinates.

So Saunderson can “project the outline of a given body, upon the surface of a hollow sphere.” At the third stage, Saunderson’s abilities imply that he can form a notion of visible figure. To show this Reid must define the concepts “real figure” and “visible figure.” He says: “as the real figure of a body consists in the position of its several parts with regard to one another, so its visible figure consists in the position of its several parts with regard to the eye.” He adds:

* Despite other similarities with Condillac about the nature of the Molyneux question, Condillac holds in the Treatise, contrary to Reid, that “if we were to give our statue a perfect knowledge of optics, it would be no further advanced” (Condillac 1982, 3.3/274).

† The two-dimensional figure of a cube will be significantly more complex than the figure of a sphere since for each degree of rotation on the X-, Y- and Z-axes, a new two-dimensional seen figure of the cube will be manifest. This makes it easier on Saunderson—so easy, in fact, that he needn’t antecedently know their angles of orientation to his eye, their respective sizes, or their distances. If he knows he is working with a cube and a sphere, that is enough. Likewise, knowledge that he is working with a square and circle will also be sufficient.

‡ At least, Saunderson will be able to identify and differentiate any real figures in virtue of the geometrical figures they produce, so long as the three- or two-dimensional objects under investigation are incapable of producing coincident geometrical figures. That is, depending upon the subject’s orientation and distance, the subject may not be able to determine that object X is a cube and object Y a rectangle. This would occur if he unluckily occupies coordinates from which X and Y produce identical geometrical visible figures. Imagine X is a cube, Y a rectangle, and Z a square. Suppose the dimensions of the side of X and the side of Y that face the subject are identical. Suppose also that the surface of square Z faces the subject head-on (as opposed to edge-on), and that the dimensions of the surface of Z are also equal to the sides of X and Y seen by the subject. Then the subject might be incapable of distinguishing between any of them. He will see a 5′ × 8′ expanse, say, and be unable to identify the object—X, Y, or Z—to which it belongs.

In Molyneux’s question the two visible figures at issue, those of a cube and a sphere, have no coincident visible figures (see section 5.4). Even in the square/circle question this holds true. This is critical because, had they possessed coincident visible figures, our subject’s reasoning would not lend his answer certainty.
As he that hath a distinct conception of the situation of the parts of the body with regard to one another, must have a distinct conception of its real figure; so he that conceives distinctly the position of its several parts with regard to the eye, must have a distinct conception of its visible figure. Now, there is nothing, surely, to hinder a blind man from conceiving the position of the several parts of a body with regard to the eye, any more than from conceiving their situation with regard to one another; and, therefore, I conclude, that a blind man may attain a distinct conception of the visible figure of bodies. (IHM 6.7, 96/143b)

Because the idealized geometer’s conceptions of visible figure are distinct, Reid infers that the subject can uniquely separate and distinguish the visible figures of the sphere and the cube (and square and circle). In effect, to say the blind man may “attain a distinct conception of the visible figure of bodies” is equivalent to saying that a blind man may conceive of the way that an object looks, in contradistinction from the surrounding visible figures. He says: “[A]s to the visible appearance of the figure, and motion, and extension of bodies, I conceive that a man born blind may have a distinct notion, if not of the very things, at least of something extremely like to them” (IHM 6.2, 79/133b). At this point it is essential to recall our distinction between types of visible figure. Reid is invoking a type of visible figure that does not require the subject to have seen anything at all. The subject acquires the concept of a visible figure as it would appear to the subject, ceteris paribus. At minimum, the subject acquires the concept of the object’s geometrical visible figure.

Someone will object that Saunderson cannot have acquired a concept of visible figure given the data available to him. Reid is aware of this objection and addresses it obliquely. He says that the blind man’s conceptions of the visible figures of an object are highly abstract and mathematical, but this is no reason to think that he could not successfully apply this knowledge to figures he sees, were he given sight. Many sighted people conceive of a variety of geometrical forms purely abstractly and without having seen or touched them. For example, we sighted people can take the definition of a dodecahedron and form a mental model of how the object would look were one to enter our field of vision. “The blind man forms his notion of visible figure in the same manner,” via abstract geometrical analysis, as someone who has formed “his notion of a parabola or a cycloid, which he never saw” (IHM 6.8, 97/144). The means by which the subject forms his notion of visible figures is clearly different from the way that sighted people do so. “The blind man forms the notion of visible figure to himself, by thought, and by mathematical reasoning from principles; whereas the man that sees, has it presented to his eye at once, without any labour, without any reasoning, by a kind of inspiration” (IHM 6.8, 97/144a).
Commentators concur that a bind subject’s concept of a visible figure of a square that he has not seen, and a sighted subject’s concept of a visible figure of a square he has seen, are identical. To reach this conclusion, these commentators lean upon operational analyses of concept possession (see Daniels 1989, 72; and Hopkins 2005, 356). With this way of looking at it, the second Molyneux question vindicates Reid’s analysis by allowing the blind subject to confirm Reid’s theory about concept acquisition and concept application behaviorally. Gareth Evans pioneered this way of interpreting the process of concept acquisition in Reid in this context.¹¹

Though he hedges his response with a number of qualifications, Reid answers this version of Molyneux’s question affirmatively. The most important ways in which Reid molds the question to suit his answer are these. First, he implicitly poses the question of subjects with certain abilities. Reid’s subject uses a geometry for visible space through which he can calculate the shape of the objects as they will appear to the eye. (I presuppose the results in Yaffe 2002.) Such an individual will be able mentally to model the position of three- (and two-) dimensional objects in this geometry, as if the facing sides of these objects were represented on the inner surface of a hollow sphere. This is why Reid says that the breadth of objects in this model will appear to the subject in direct proportion to the size of the angle the object presents to the center-point of the sphere. Since this blind subject can deduce the visible figures of spheres and cubes (and circles and squares), he will be able to differentiate one from another when he sees their visible figures. The blind subject performs these inferences “by information and reflection” and not by using any sensations.

In a sense this broad requirement that subjects possess certain abilities is present in others’ answers too, for example the newly sighted people must not

¹¹ Evans implies that to know one is presented with a square visual array is to be disposed to reach in certain ways. He says: “no explanation can be given of what it is to have a perceptual representation of space—to be given perceptually the information that objects of such-and-such a character are arranged in such-and-such a way in one’s vicinity—except in terms of the behavioural propensities and dispositions to which such information gives rise” (Evans 1985, 371). From this he mounts what seems to me to be a transcendental argument about the necessary structure of experience in our spatial behavioral framework, to the effect that: “it must be profoundly unitary. He concludes that ‘it is not possible to have a conception of an objective world—a world whose states and constituents are independent of one’s perception of them—without conceiving of that world as spatial, with oneself as located within it and tracing a continuous path through it’” (Evans 1985, 369; see Cassam 1997, Chapters 2 and 3).

There is some conceptual distance between Evans’s response and Reid’s, though I do not think the distance invalidates Evans’s approach to Reid. While Evans and Reid both return strong “yes” answers, Evans’s response appeals to the status of the subject’s “behavioral framework.” Evans’s answer marks a stronger “yes” than either Leibniz’s or Reid’s because Evans’s appeal to the structure of the manifold of human experience lends itself to an interpretation on which it is necessarily the case that the subject will know a cube from a sphere under Molyneux’s conditions. Neither Reid nor Leibniz would be comfortable with that way of putting the point.
have too much degradation in their visual cortex, must have fully functioning
tactile faculties, and so on (Denis Diderot and Adam Smith appreciated this
point better than did Reid.¹²) Has Reid’s use of Saunderson left the bounds
of the questions’ implicit ceteris paribus clauses? Molyneux does not explicitly
prohibit the use of abstract reasoning after sight is restored in (9.1) and (9.2),
though in (9.3) and (9.4) Molyneux and Locke invoke temporal constraints
upon answers (the subject’s judgment must be given “immediately” and “at
first sight”). In neither case, though, is there a prohibition on abstract reasoning
prior to posing the question to the subject.

When discussing Saunderson, Reid’s second alteration to Molyneux’s ques-
tion involves a subtle interpretation of its relative clause. This point assists
in understanding what Reid holds to be the role of depth perception in
addressing Molyneux’s questions (see Evans 1985). Molyneux wants to know
the answer to question (9.1): “Could the subject know, by sight and prior to
touching the objects, which is the cube and which the globe?” This question
is ambiguous in a crucial way. Molyneux might be inquiring about (9.1.i)
which three-dimensional object is the cube and which is the globe. But he might
be inquiring about (9.1.ii) which two-dimensional visible figure represents the cube
and which represents the globe.

In the foregoing discussion of Saunderson’s affirmative answer to the
cube/sphere question, Reid interprets the question as asking which two-
dimensional visible figures represent the cube and sphere. This is because

¹² This point must not be overlooked if one wants an empirically adequate answer to any of
Molyneux’s questions. This also cautions any hasty comparison between the visual abilities of the blind
and of neonates. Reid mentions that inactivity creates an idleness in our muscles that causes unpleasant
sensations (EIP 2.16, 197–9/312a–b). But he does not bring the effects of idleness to bear upon the
Molyneux problem, and so overlooks the role of developmental physiology on the problem. Adam
Smith does not make this mistake, instead showing an acute awareness of the fact that our faculties
deteriorate without use. He emphasizes the importance of the observation that Cheselden’s boy was
not totally blind (1780, 158). Smith says: “though it may have been altogether by the slow paces
of observation and experience that this young gentleman acquired the knowledge of the connection
between visible and tangible objects; we cannot from thence with certainty infer, that young children
have not some instinctive perception of the same kind. In [the subject] this instinctive power, not
having been exerted at the proper season, may, from disuse, have gone gradually to decay, and at last
have been completely obliterated. Or, perhaps, (what seems likewise very possible,) some feeble and
unobserved remains of it may have somewhat facilitated his acquisition of what he might otherwise
have found it much more difficult to acquire” (1780, 161).

He adds that children: “appear at so very early a period to know the distance, the shape, and
magnitude of the different tangible objects which are [visually] presented to them, that I am disposed
to believe that even they may have some instinctive perception of this kind; though possibly in a much
weaker degree than the greater part of other animals. A child that is scarcely a month old, stretches
out its hands to feel any little play-thing that is presented to it” (1780, 165). Lacking any opportunity
to develop and sustain our visual system puts a congenitally blind Molyneux subject’s visual system
in worse shape than any infant’s system, as has been shown through studies of the development and
growth at the neuronal level in the visual cortex.
the subject could use abstract reasoning to understand the nature of the isomorphic representational relationships between his two-dimensional visible figures (which technically exist in three-space; see Ch. 4, fn. 4) and the three-dimensional objects responsible for them.

Were Reid to interpret the question in accord with (9.1.i), then he will answer "no" because of his denial that Molyneux’s subject will have any concepts of distance or depth. Such concepts are required to entertain that question. In order to know which three-dimensional object is which, the subject must be capable of applying spatial concepts like depth to the figures in his field of vision, and Reid denies that any subject could do that. In the previous section I explained Reid’s “no” answer, which he justifies in part on the grounds that Cheselden’s says that his patient “thought, at first, that everything he saw touched his eye” (IHM 6.3, 85/137a). This, and its context, reveal Reid’s stress upon the inability of the subject to see objects as having depth. This marks a reason to infer that in his discussion of Cheselden’s boy, Reid was answering (9.1.i).

One final point in this connection is about Molyneux’s work. By introducing Saunderson into the question, Reid sharply amends Molyneux’s principal aims in posing the question. Molyneux was known by Reid primarily to be concerned with distance perception. This constitutes the major theme in Molyneux’s forgotten *Dioptrica Nova: A Treatise of Dioptricks*, the highlight of which is a proof that distance cannot be perceived (1692, 113 ff.). This background provides another reason to think that Reid assumed that Molyneux’s question about the recognition of cubes and globes was actually intended to test whether concepts of depth could be acquired through a virginal, untrained use of vision. In contrast, it is improbable that Reid would have believed that Molyneux was merely interested in a question about object individuation and identification.

So Reid’s “no” is consistent with his “yes,” since he is in effect answering (9.1.i) with a “no” and (9.1.ii) with a “yes.”

9.4. Saunderson and the Square/Circle Question:

“**Yes**”

Cheselden’s young patient was asked a question about cubes and globes, which tacitly requires him to possess and apply concepts of depth to his new visual perception in order to distinguish between them. This is so on Reid’s assumption that visual perception of depth is required to answer that question.
affirmatively. It is in that context that Reid insists that distance is not an object of sight, and that the subject could form no judgment about the distance of objects from him. He repeats Cheselden’s claim that the boy thought that all the objects abutted his eye. He can’t perceptually distinguish cubes from spheres in his visual field if he thinks that all seen shapes are touching his eye, because it is a necessary condition for individuating a cube in his visual field that he understands that at least some angled lines on the edges of the cube retreat from the eye’s surface.

Here is another way of expressing the point behind this necessary condition. If the boy cannot determine the difference between a square and a cube, then he cannot make a bona fide claim to be able to distinguish a globe from a cube. This is because, for all the boy knows, he could be distinguishing what in his experience is a square from the globe (or, for all he knows, from the circle) even though he thinks he is distinguishing a cube from a globe. In Cheselden’s report of the case, the boy’s claim about the objects all abutting the surface of his eye implies, on Reid’s interpretation, that the boy was not able to distinguish between a square and a cube. With these attempts to specify the conditions upon an answer we glimpse the depth of, and philosophical trouble generated by, Diderot’s alteration of the question.

Reid’s discussion of Saunderson’s abilities perceptually to discriminate objects upon having his sight restored occurs in Inquiry 6.7, which we have just examined. Reid continues the debate in Inquiry 6.11 but to a different purpose. In 6.11 Reid hypothetically poses of Saunderson not a cube/sphere question, but a square/circle question. This passage is more explicitly directed at the Molyneux problem than is 6.7.

Why two distinct discussions both mentioning Molyneux-like problems? It seems open to Reid to reason as follows to eliminate the need for a second discussion:

Suppose I am correct in arguing that Saunderson would reply affirmatively to the cube/sphere question. Saunderson would give the same answer to a square/circle question. This is because a square circle question is considerably easier to answer insofar as it removes from the question all the muddy, inchoate issues about depth and depth perception. So my argument for Saunderson’s “yes” answer to the cube/sphere question entails a “yes” to the square/circle question. QED.

However, Reid did not approach the square/circle question in this way. He chooses to treat it more or less independently of his previous discussion. It is worthwhile to learn what motivates Reid to pose the question in yet another form here.
He begins this discussion by saying:

[L]et us suppose such a blind man as Dr Saunderson, having all the knowledge and abilities which a blind man may have, suddenly made to see perfectly. Let us suppose him kept from all opportunities of associating his ideas of sight with those of touch, until the former become a little familiar; and the first surprise, occasioned by objects so new, being abated, he has time to canvas them, and to compare them, in his mind, with the notions which he formerly had by touch; and, in particular, to compare, in his mind, that visible extension which his eyes present, with the extension in length and breadth with which he was before acquainted. (IHM 6.11, 117/155a)

Reid says Saunderson has "all the knowledge and abilities which a blind man may have." We might call Reid’s Saunderson "tactilely omniscient," for he has every concept that can be suggested to him by his tactile sensations. This marks a great contrast with the actual subject Cheselden examined.

Someone such as Saunderson will be able to identify through vision "the figures of the first book of Euclid." The first book includes descriptions of squares, triangles, rhombuses, parallelograms, and other multilateral figures. Reid also discusses other plane figures, like circles, earlier in this context (IHM 6.11, 118/155a). This context is clearly about the subject’s ability to distinguish between two-dimensional objects under Molyneux’s conditions. Saunderson can answer such a question affirmatively.

Diderot reformulates Molyneux’s question to be about two-dimensional figures in part because he believes that cube/sphere questions constitute an ambiguous amalgamation of distance questions with perceptual discrimination questions.¹³ In cube/sphere questions the emphasis may be placed upon the newly sighted subject’s ability to see three dimensional objects like a cube and a sphere at all. Alternatively, the question may presuppose that the subject can see that an object exists in three dimensions, and instead focus upon the subject’s ability perceptually to discriminate between and identify the two distinct three-dimensional objects. (This is the shift we identified in Molyneux’s earliest questions in the 1688 letter.)

Due to this presupposition, Diderot’s question is thought to offer a purer means to assess the extent of our cross-modal perceptual capacities. It is a mistake to think that the only means by which I can see what I can touch is by seeing three-dimensional objects. If I trace a square on a flat surface with my

¹³ “I have substituted a circle for a sphere and a square for a cube, because there is reason to think that we only judge of distances by experience; and of course he who uses his eyes for the first time sees only surfaces without knowing anything of projection, since a projection consists in certain points appearing nearer to us than others” (Diderot 1972, 137).
fingertip, I tactiley experience a two-dimensional figure. Even if upon having
my vision restored I cannot visually apprehend that a figure has depth, I would
not for that reason alone be unable visually to apprehend that a figure is a
square and not a circle. Diderot’s question poses a test for the cross-modality
of perception without assuming that, if perception is cross-modal, depth must
be visually perceived.

The fact that Reid addresses a Diderot-style question indicates that he is savvy
to this nuance of the debate. But for Reid the square/circle question does not
take on the importance that it does for someone like Diderot himself. Diderot
holds that the square/circle question can be answered affirmatively but that the
cube/sphere question cannot. Since Reid tacitly offers an affirmative answer
under the stringent conditions of the cube/sphere question by way of appeal to
abstract reasoning, the square/circle question becomes less interesting. This is
because Reid rejects Diderot’s assumption that in order to answer a cube/sphere
question affirmatively, the Molyneux subject must visually perceive the depth
of cubes and spheres. Reid holds that Saunderson can distinguish the cube
from the sphere even though he cannot visually apprehend the depth properties of
either the cube or sphere.

9.5. The Role of Tactile Sensations in Affirmative Answers

Is it a necessary condition on an affirmative answer that the subject compare
the representational features of his visible figures with his previous tactile
experiences?

The answer to this question demarcates the boundary between what
we might call “strongly affirmative” and “weakly affirmative” answers to
Molyneux’s questions. Leibniz brings some important qualifications to his
affirmative response that render it only a weak “yes.” Having felt cubes to have
edges and points, and having felt spheres to have neither, the newly sighted
person can correctly identify the sphere and cube as presented in his visual
field. For Leibniz a “yes” will be forthcoming if the agent is informed that the
two objects he is looking at are a cube and a globe, if the agent needn’t answer
immediately, and the agent compare his new visual ideas with his former tactile
ideas of cubes and spheres.¹⁴

¹⁴ “It may be that Mr Molyneux and the author of the Essay are not as far from my opinion as at
first appears… If you will consider my reply, sir, you will see that I have included in it a condition
In the *New Essays* 2.9 §8, Leibniz says, “by applying rational principles to the sensory knowledge which he has already acquired by touch,” the agent will be able to distinguish them. The newly sighted man can determine which figure is of the cube and which is of the sphere because “in the case of the sphere there are no distinguished points on the surface of the sphere taken in itself, since everything there is uniform and without angles, whereas in the case of the cube there are eight points which are distinguished from all the others” (Leibniz 1981, 136–7). The subject can compare what it was like to handle a cube and handle a sphere with what it is like to see the figure of a cube and see the figure of a sphere. Leibniz alleges that this comparison is of sufficient phenomenological richness that the subject can answer affirmatively.

On these grounds Leibniz agrees with Berkeley and Locke on a crucial presupposition about the meaning of Molyneux’s problem: it can be resolved by determining the extent to which there is resemblance between our perceptual experiences across the sensory modalities of touch and sight. Locke and Berkeley happen to think that there is no resemblance of the relevant sort. Leibniz thinks that there is enough resemblance to allow the subject to map his tactile sensations of edges on to the straight lines in the visible figure of the cube. Leibniz’s version of the question can be put as follows:

(9.6) By the combination of (i) abstract reasoning, (ii) antecedent knowledge that the only objects in his visual field are a cube and a sphere and (iii) successful comparison of aspects of tactile sensations that suggest cubes and spheres with see visible figures that represent cubes and spheres, and prior to touching the objects in his visual field, could the subject distinguish the cube from the globe?

On the basis of (9.6.iii) Evans comments that Leibniz seems to be an advocate of Berkeley’s general position about the acquisition and application of spatial concepts as requiring multi-modal experience (Evans 1985, 379–80). Both hold that the role of tactile sensations in an agent’s behavioral framework is “the most fundamental issue” raised by Molyneux (Evans 1985, 372). We must compare tactile sensations or ideas with visual sensations or ideas. Leibniz thus offers a weak “yes” because it is beholden to this presupposition.

It appears that at least one of Reid’s affirmative answers is committed to the same requirement. In *Inquiry* 6.11 Reid explicitly says that Saunderson would “compare [‘ideas of sight’], in his mind, with the notions which he formerly

which can be taken to be implicit in the question: namely that it is merely a problem of telling which is which, and that the blind man knows that the two shaped bodies which he has to discern are before him and thus that each of the appearances which he sees is either that of a cube or that of a sphere” (Leibniz 1981, 2.9.8/136).
had by touch; and, in particular, to compare, in his mind, that visible extension which his eyes present, with the extension in length and breadth with which he was before acquainted” (IHM 6.11, 118/155a). Reid adds:

[W]hen this visible extension and figure are presented to his eye, will he be able to compare them with tangible extension and figure, and to perceive that the one has length and breadth as well as the other; that the one may be bounded by lines, either straight or curve, as well as the other. And, therefore, he will perceive that there may be visible as well as tangible circles, triangles, quadrilateral and multilateral figures. (IHM 6.11, 118/155a)

Reid envisions someone in Saunderson’s situation employing all the resources at hand in an effort to answer Molyneux’s question, including by comparing sensations. Reid does not say that the subject must do a comparison, but he suggests that through such a comparison the subject can answer “yes.” So Leibniz and Reid, in Inquiry 6.11, offer a similar, weak answer.

Evans himself offers a strong “yes” because no comparison on the agent’s part is required due to his quasi-transcendental considerations about concept identity. Evans hints that Reid offers a strong “yes” because Reid offers his affirmative answers without requiring that the subject engage in a cross-modal comparison of sensations. This runs against the passage just quoted from Reid, but Evans is correct about this. This is because Reid’s answer in Inquiry 6.7 does not invoke any requirement that the subject compare sensations.

Strictly speaking, we need to distinguish between its being necessary for a “yes” answer that a subject has tactile sensations at all and its being necessary that the subject compare his new visual experience with his former tactile sensations. It is possible that tactile sensations are needed in order for the agent to understand the question, but that no comparison between tactile sensations is needed. That is, tactile sensations are needed in order to acquire the concepts “cube” and “sphere.”

Yet the answer Reid offers in Inquiry 6.7, as posed of the visual representations of a cube and sphere, is constructed so that a “yes” is forthcoming even though Saunderson does not actively compare his experiences of touch with his new visual experiences. This feature of Reid’s answer in Inquiry 6.7 makes it a strongly affirmative response, in contrast to Leibniz’s weakly affirmative response. That is, Reid denies (9.7.iii) is a necessary condition on a “yes” answer. (This is not to say that Reid does not also offer a weakly affirmative response. He does, and we have studied it in Inquiry 6.11.)

To justify this claim, let’s first summarize a few conclusions. First, Reid says that the Idomenians can possess concepts of a figure with four sides of equal lengths, for example. This generalizes to humans under the conditions of
Molyneux’s questions. Suppose that, in addition to being congenitally blind, Saunderson had never experienced any tactile sensations. In adulthood his sight is restored, though he is still unfeeling. Reid would suggest that merely by reasoning through the definitions of the terms “square” and “circle,” Saunderson could distinguish between them and offer up a “yes” answer. Thus, for the square/circle question, I suggest that Reid does not believe that any tactile sensations are necessary.

Next, could the Idomenians acquire concepts of the geometrical figures of cubes and spheres? In my discussion of geometrical visible figure above in §4.3, I described this form of visible figure as being the geometrical representation of the facing surfaces of a three-dimensional object as that object is modeled on the surface of a sphere in accordance with Reid’s geometry. Reid explicitly says that Idomenians can have no notion of a third dimension (IHM 6.9, 106–7/149a). Nothing prevents them from seeing the visible figure of a cube and contrasting that with a visible figure of a sphere. But they are unable to have a concept of those figures as representing anything in three dimensions. This result generalizes to any unfeeling human subject. The implication is that tactile sensations of a cube are necessary to acquire the concept “cube” and understand the meaning of saying that the two-dimensional visible figure isomorphically represents a three-dimensional figure. This implies that in order to understand a question posed about the geometrical figures of a cube and sphere, the subject must have had some experience of a third dimension. (Reid gives no indication that the needed tactile experiences must be of cubes and spheres. Presumably a “yes” answer to Molyneux’s question will be forthcoming so long as the agent can extrapolate from his tactile experience of cylinders and pyramids.)

As we turn from Inquiry 6.11 to Inquiry 6.7, Reid eschews talk of comparing information from touch and sight. Reid makes different remarks about the relation between tactile sensations and “yes” answers. Recall from our discussion of visible figure that visual sensations are unnecessary for the formation of Saunderson’s concepts of geometrical visible figures. Blind Saunderson does not need visual sensations in order mentally to model the geometrical visible figures of specific objects. This is what leads Reid to say: “it is worthy of our observation, that there is very little of the knowledge acquired by sight, that may not be communicated to a man born blind” (IHM 6.2, 78–9/133b). However, to come to such understanding Saunderson must be provided with information derivative from tactile sensations. Distance concepts must enter his abstract reasoning about the way geometrical visible figure will appear to his eye in two ways. He must be given the size of the objects in three dimensions and their distance from his eye. So he must employ depth and distance concepts he acquires from touch in order to respond to Molyneux’s questions.
affirmatively. This represents a distinct way in which tactile experience bears on "yes" answers.

At *Inquiry* 6.7 Reid says that he "require[s] no more knowledge in a blind man, in order to his being able to determine the visible figure of bodies, than that he can project the outline of a given body, upon the surface of a hollow sphere, whose centre is in the eye" (IHM 6.7, 95/142b). Here Reid tacitly implies that the blind person does not need to do any comparing of visual and tactile sensations in order to identify and distinguish between visible figures of different lengths and breadths. This is a feature that differentiates Reid's *Inquiry* 6.7 "yes" answer from Leibniz's "yes" answer. Reid does not require that the agent compare the degree of resemblance between a tactile sensation and a visual sensation.

We can see in Leibniz's writing on this matter the presence of what Reid took to be a hallmark of the Way of Ideas. Leibniz requires the comparison of tactile sensations with newly present visual sensations. This appeal to the agent's comparison resonates with the Way of Ideas' presupposition that sensations are needed to arrive at primary quality concepts. (This remains true even though Leibniz denies such a requirement in other contexts.) Reid says the Way of Ideas affirms that "no material thing, nor any quality of material things, can be conceived by us, or made an object of thought, until its image is conveyed to the mind by means of the senses." This implies that "to every quality and attribute of body we know or can conceive, there should be a sensation corresponding, which is the image and resemblance of that quality" (IHM 6.6, 91/140b). It was the burden of Chapter 3 to show how, through his Sensory Deprivation argument, Reid denies this condition for concept formation. His "yes" answer further confirms the conclusion of that argument.

9.6. "Yes" Answers and the Perception of Mind-independent Objects

Reid's discussion invites us to rethink what the Molyneux problem means for a theory of perception. I said at the outset of the chapter that through an analysis of Reid on Molyneux's problem we would draw together several of the themes discussed earlier in the book. In order to fulfill this promise I need to step back from the minutiae of Reid's arguments and discuss what he believes is the philosophical significance of the questions.

Most philosophers have taken the central consequence of the debate as illuminating the nature of cross-modal perception by asking such questions
as: can information between our sensory systems be shared even without cross-modal experiences of similar objects? If so, then what is the extent of this sharing? If not, then has Locke accurately described the mind as a *tabula rasa*?

Locke’s negative answer to Molyneux’s question shows that having cross-modal sensory experience is necessary for the formation of visible figure concepts. Berkeley’s “no” confirms that the “objects” of which we speak are not mind-independent objects different in kind from our sensations. In broad terms Reid’s affirmative answer shows that we can attain empirical knowledge about a mind-independent reality with a bare minimum of sensation experience.

To understand the way this fits into Reid’s quiver of objections against the Way of Ideas, compare his approach to Molyneux’s problem and his Sensory Deprivation argument. Through this argument and its accompanying thought experiment, Reid concludes that tactile sensations are *insufficient* for our formation of primary quality concepts (IHM 5.3, 61/122b). In addition to the fact that tactile sensations are insufficient for acquisition of primary quality concepts, comparing tactile sensations with new visual experiences is not necessary for affirmative answers to Molyneux’s object-identification in the style of (9.2).¹⁵ His “yes” answers to Molyneux’s questions finish what his crucial test started.

The major thrust of Reid’s response to Molyneux’s questions is to reduce the dependence of concepts and knowledge upon sensations, and thereby oppose a core tenet of the Way of Ideas. We have seen this at work throughout this book, and especially in Chapter 5. Reid stands between these views and says that *some* sensations are needed for the formation of concepts of visible figure. This implies that Reid is not claiming that we have innate ideas of primary qualities. He argues that we needn’t have any *visual* sensations in order to form concepts of visible figure. Hopkins emphasizes this point:

Reid is pursuing a core ambition, that of showing, *contra* the Ideal system, that some of our most important concepts are not constitutively tied to sensation. He focuses on the concept *visible figure*, not just because it is in general his most extensive illustration of that point, but because, in the context of Molyneux’s question, it allows him to argue the point in a distinctive way. If a blind subject can grasp that concept, it cannot be tied to sensation, since the blind lack *any* of the candidate sensations. (Hopkins 2005, 352)

Concepts that can be formed through the use of visual sensations need not be formed through the use of visual sensations. Framing Reid’s response in

¹⁵ This emphasis elucidates why our earlier discussion of the role of sensation in perception was attenuated. The most we could squeeze out of Reid’s remarks on sensation was that tactile sensations are probably physically necessary for the acquisition of concepts involving depth and three-dimensional extension. The physical necessity of sensation thesis could not be given broader scope because Reid holds that we need not have visual sensations to form concepts of visible figures.
this manner reveals the extensive continuity between Reid’s discussion of Molyneux’s questions, his Sensory Deprivation argument, and his analysis of the mind-independence of visible figure.

The matchlessness of this plan and Reid’s fascinating execution of it is so novel for the Early Modern period that it may be difficult to appreciate. But reconsidering core commitments of Hume and Berkeley can help us. One of Hume’s claims about impressions and ideas—one of the “articles of inquisition”—is that each idea must be traceable back to a corresponding impression. This is why, for example, Hume worries about the missing shade of blue. To appreciate the anti-sensationism in Reid’s answers to Molyneux we can see Reid’s “yes” answer as offering another counterexample to Hume’s thesis. According to the Way of Ideas, impressions determine the semantics of the idea and they provide the subject with the ability to acquire the idea in the first place (Hopkins 2005, 353). But Reid has shown that subjects are capable of forming rich visible figure concepts without any visual sensations, and with a minimal set of tactile sensations.

Hume misunderstood this theme in Reid’s work, which is apparent from his comments upon Reid’s Inquiry (which are reprinted in Wood 1986). The way Reid discharges sensations from the purposes they served in the systems of his predecessors led Hume to the inference that Reid endorses a theory of innate ideas. But the advanced copy of the Inquiry that Hume was able to read did not include the final, longest, and all-important chapter of the Inquiry about sight (Wood 1986, 413). Had he been, he would have more clearly understood why Reid does not rely upon innate ideas. Reid shows through Saunderson’s case that, when human beings do their utmost with what they are provided through their senses, they can gain knowledge.

As Reid diminishes the role of sensations, he reclaims the role of the mind-independent world in determining the intentional objects of perceptions. Reid holds that the speculative principles about ideas, too frequently conflated with a commitment to empiricist accounts of perception, lead Berkeley and Locke astray on the Molyneux problem. Reid’s response displays his Newtonian methodology, and contrasts with theirs.

Berkeley says nothing is like an idea but another idea. He repudiates representative realist versions of the Way of Ideas in favor of his idealism on these grounds. We cannot perceive mind-independent primary qualities because in order to do so there must be a resemblance between my sensory idea and my quality idea. Berkeley’s argument led him to claim that there was also no resemblance between what we see and what we touch, and thus there are no “common sensibles”—no qualities perceived by more than one sense faculty. Reid believes that his study of Molyneux’s questions rebuts this claim. He says:
Hence it appears that small visible figures (and such only can be seen distinctly at one view) have not only a resemblance to the plain tangible figures which have the same name, but are to all sense the same: so that, if Dr Saunderson had been made to see, and had attentively viewed the figures of the first book of Euclid, he might, by thought and consideration, without touching them, have found out that they were the very figures he was before so well acquainted with by thought. \(\text{(IHM 6.11, 118/155a–b, my emphasis)}\)

Reid infers that “Bishop Berkeley therefore proceeds upon a capital mistake, in supposing that there is no resemblance betwixt the extension, figure, and position which we see, and that which we perceive by touch.” \(\text{(IHM 6.11, 119/155b).}\)

One might object that Reid is willing to proceed on this point without having accurate experimental data at hand. I accused Berkeley of doing just that; perhaps a defender of Berkeley would reply with the same charge. True, the Cheselden case aside, Reid is willing to give an answer to the hypothetical question. But he cautiously answers this hypothetical question, and does not universally generalize in the way others had. Some blind people, upon being given sight, can distinguish the visible figures of cubes from the figures of spheres. Others cannot. Besides, through his research into the nature and phenomena of vision—work on upside-down retinal images, parallel motion of the eyes, images on both retinas, and research on the phenomenon of squinting—Reid reasons from an extensive body of empirical evidence. This informs his inferences about the physical abilities of the blind to create mental models for visible figures.

Good evidence of his Newtonian approach to Molyneux lies in the chief implication of his affirmative answer. Berkeley claims that objects of sight and of touch are incommensurable. If one is concerned to preserve our causal relations to the mind-independent world in our perceptual experience, then Berkeley’s response to Molyneux is a forlorn disappointment. According to Reid, the objects of sight and touch are unified in mind-independent space and “are to all sense the same.” With his defense of the homogeneity of the objects of perception across the senses Reid argues that tangible and visible experience is integrated. Reid believes this result to be of paramount importance for natural science.

The rules [geometers] have demonstrated about the various projections of the sphere, about the appearances of the planets in their progressions, stations, and retrogradations, and all the rules of perspective, are built on the supposition that the objects of sight are external. They can each of them be tried in thousands of instances.... Add to this, that, upon the contrary hypothesis, to wit, that the objects of sight are internal, no account can be given of any one of those appearances, nor any physical cause assigned
why a visible object should, in any one case, have one apparent figure and magnitude rather than another (EIP 2.14, 185/305a).

The foundation for the triumph of a unified perceptual space lies in Reid’s theory of vision. The Molyneux problem composes an intriguing and rigorous test case for the application of Reid’s theory of vision to a perceptual problem.

Due to the conceptually tight relation between the objects of vision and of touch, Reid grounds a realist science of vision—a feat made difficult for his predecessors. For Berkeley such a relation, and a science, is in principle impossible, or so it is argued (Falkenstein 2004, 165). Reid instead argues that visual space is fundamentally objective across perceivers, and is not relative but real. This answer proceeds from his earlier work on the geometry of visibles and the perceptual and ontological status of visible figure. Reid’s insistence on the objectivity and unity of space spans across one’s sense of vision and of touch, as well as across perceivers themselves. In his discussion of Molyneux Reid adopts a position with respect to the nature of our awareness of space. But this is of a piece with his understanding of the objectivity and unity of space itself. Reid’s sentiments about the vituperative controversy early in the eighteenth century surrounding the status of space as absolute (Newton and Clarke) or relative (Berkeley and Leibniz) are clearly with Newton. At the highest remove, the implications of Reid’s response to Molyneux’s questions resonate with Reid’s claims on behalf of Newton, Clarke, and Colin Maclaur- in that space is absolute and objective, and that there is an absolute frame of reference. I leave the explorations of this connection, and of Reid’s views on the nature of space, for another time.

9.7. Summary

Reid’s reflections on the unity of the senses and on our multifaceted perceptual relationships to the mind-independent world arise through his discussion of Molyneux’s questions. A standard form of Molyneux’s question is: “Can someone who has been blind from birth and who has newly been given sight, determine through vision alone which object in her field of vision is a globe and which is a cube?” In order to identify and appreciate Reid’s responses to these questions, we first determined the forms that different versions of the questions have taken. Reid provides different answers to different historical forms of the question. As posed to young, inexperienced, and uneducated people, Reid claims that the answer is “no,” while when the question is posed of people adept at geometry and spatial reasoning the answer is “yes.”
We considered what occurs when Diderot’s alteration in the content of the question—a shift between three-dimensional objects to two-dimensional objects—is made. Here Reid also answers affirmatively. His geometry for visibles serves his “yes” answers.

Reflection upon these monosyllabic answers offers considerable insight into Reid’s theory of perception, and its differences with competing theories. Reid is committed to commonsensical claims about our relation to the mind-independent world. We routinely perceive things in it. We routinely perceive the same mind-independent objects over time and with different sense faculties. We perceive the same objects. We routinely have knowledge of our perceptual beliefs. “No” answers to Molyneux questions threaten commitments such as these by dividing our perceptual apparatus into incommensurable functional units, by implying that ideas mediate our perceptions, and by inhibiting scientific inquiry about the mind-independent world.

I drew together aspects of Reid’s theory of perception by explaining the correlation between Reid’s Sensory Deprivation argument, his theory of sensation, and his answer to Molyneux. Reid claims that Saunderson can attain knowledge of geometrical figures, which Saunderson could apply to the seen figures of globes and cubes, were he given sight. This resonates with Reid’s discussion of the relation between sensation and perception because he believes that sensations are not necessary for perception and perceptual knowledge. In this way his response to Molyneux’s problem finished what his Sensory Deprivation argument started: sensations need not and in fact do not obstruct our perceptual capacities.