Berkeley and the ‘Mighty Difficulty’: The Idealist Lesson of the Inverted Retinal Image

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It’s a child’s problem: we see objects as oriented correctly, both up-down and left-right, despite the fact that our retinal images of them are inverted in both respects; how can this be? The reason it is a child’s problem is that the explanation is so easy: there is no reason to think that the properties of our retinal images should correspond to the content of the visual experiences they cause. Our retinal images are tiny; we see things as much larger. Our retinal images are uniformly the color of the retina; we see things as possessing a diversity of colors. None of these discrepancies, including the discrepancy in orientation, are unexpected, and so none genuinely problematic.

And yet among those who have struggled with the problem are a startling number of the great minds of the early modern period: Kepler, Descartes, Malebranche, Molyneux, Newton, and Reid are among those who wrote about this issue. George Berkeley, who made greater strides in understanding vision than anyone before him, and whose work on vision set the stage for all further work in both the psychology and philosophy of vision, describes the discrepancy between, on the one hand, retinal image orientation and, on the other, the orientation objects are represented as having in visual experience a “mighty difficulty” (NTV 88) and the solution to “this knot . . . the principal
point in the whole optic theory, the most difficult perhaps to comprehend, but the most deserving of our attention, and, when rightly understood the surest way to lead the mind into a thorough knowledge of the nature of vision" (TVV 52). What is Berkeley on about? What difficult problem is concealed beneath the surface of this child’s problem? And what, exactly, do we learn about vision when we solve it?

One way to make a problem out of a fact is to find a theory to which one is wedded that seems in conflict with it. The problem then becomes how to reconcile fact with theory. A particularly naive theory of visual perception is in conflict with the fact of retinal image inversion:

The Naive Theory: S sees that object O has property P only if every part or feature of S crucial to the perception of the fact that O is P itself has P.

That is, according to the Naive Theory, visual perception of properties is a matter of property-transmission. The object causes the retinal impression; the retinal impression causes nerve firings; those cause some sort of brain event; perhaps this causes an “idea” or some other mental item. According to the Naive Theory each of these states has to actually be like the object for us to see how the object is.

Neither Berkeley nor his predecessors held the Naive Theory; probably nobody’s ever held it in quite so naive a form. But many of Berkeley’s predecessors, notably Descartes and Malebranche, did hold a theory related to it. Following Margaret Atherton, we can call this widely held view “The Geometric Theory”:

The Geometric Theory: S sees that object O has property P only if every part of S crucial to the perception of the fact that O is P itself has some property necessarily connected to P.

According to the Geometric Theory, all the various states involved in the sequence from object to visual experience have to have a property, not identical to that of the object, but from which the seen property of the object could, in principle, be deduced. The Geometric Theory seems, anyway, to be capable of accommodating the fact of retinal image inversion: there is a simple geometrical transformation mapping the retinal image’s orientation properties to those of the object that causes it. Thus, according to the Geometric Theory, when a person sees that an object has a particular property, he employs, probably unconsciously, this geometric transformation in order to extract the information about the object’s actual orientation from the orientation of the retinal image. Descartes famously illustrated this by likening looking at an object to feeling it with crossed sticks: what one feels on one’s right one takes to be on one’s left and vice versa (and similarly for upper and lower).
Berkeley’s objections to the Geometric Theory are well known.¹ The most important of them is this: Berkeley rejects any explanation of the role that a particular state plays in perception that appeals to features of that state that are not, themselves, accessible to consciousness. Since the Geometric Theory appeals to various features of the retinal image—notably its orientation and the geometric function mapping its orientation to that of the perceived object—that are not accessible to consciousness, it offers an unsatisfactory explanation of the role of the retinal image in perception. Notice, however, that this way of dispensing with the Geometric Theory’s explanation of the fact of retinal image inversion is not special to that issue. Thus, the inability of the Geometric Theory to adequately account for the role of the retinal image in perception can hardly be called “the principal point in the whole optic theory.” Further, Berkeley’s discussion of the issue does not end with his rejection of the Geometric Theory but continues on for more than twenty-five additional sections of NTV. Berkeley, then, doesn’t consider the fact that retinal images are inverted to be of interest solely because of its pertinence to the Geometric Theory. He must think the issue has some other additional import. But what?

The answer to this question will emerge in a somewhat roundabout way. In section I, I describe a problem that one encounters when trying to interpret Berkeley’s solution to the problem of the inverted retinal image in a way that remains consistent with his views on other closely related topics. Section II offers an alternative interpretation of the solution that solves the interpretive problem of section I. Section III uses this solution to the interpretive problem to answer the question with which we began (that is, “What’s Berkeley on about?”). Once we see what Berkeley’s solution to the problem of retinal image inversion really is, it becomes clear why he thinks the problem so important. It emerges, that is, that Berkeley has strong (although not decisive) reasons for thinking that the puzzlement that one might feel when encountering the fact of retinal image inversion can only be dispelled by accepting idealism. Overcoming the “mighty difficulty,” then, requires a mighty leap.

A couple preliminary points: First, I am assuming that Berkeley’s talk of “visible” and “tangible” objects should be understood like so: a visible object is the intentional object of a visual experience; a tangible object is the intentional object of a tactile experience. Berkeley holds, of course, that no visible object is identical to any tangible object. However, that claim is not built in to the definitions of the terms “tangible” and “visible object”—those definitions
allow the possibility that a person's visual and tactile experience have the same intentional object—but rather requires independent argument. Second, I am assuming throughout that for Berkeley terms that refer to objects are almost always systematically ambiguous in their reference between a visible and a tangible object. The term “that chair” does not specify whether the visible or tangible chair is being referred to. As it happens, the visible and tangible chair robustly co-occur in experience but, strictly speaking, the thing a perceiver encounters in touch and the thing encountered in vision are not identical. This ambiguity even affects such terms as “retinal image.” The tangible retinal image is the object that would be encountered by someone who was able to feel his retina affected by light; the visible retinal image is the object that would be encountered were he to employ some sort of tool for looking at his retina. Much of what Berkeley has to say about retinal image inversion requires keeping careful track of the distinction between visible and tangible objects.

I.

Berkeley introduces the problem of the inverted retinal image at NTV 88. The problem appears to be solved, once and for all, at NTV 114—although, as I will argue in section II, this is not, in fact, the final solution—where Berkeley writes,

If we confine our thoughts to the proper objects of sight, the whole is plain and easy. The head is painted farthest from, and the feet nearest to, the visible earth; and so they appear to be. What is there strange or unaccountable in this? Let us suppose the pictures in the fund of the eye to be the immediate objects of the sight. The consequence is that things should appear in the same posture they are painted in; and is it not so? The head which is seen seems farthest from the earth which is seen; and the feet which are seen seem nearest to the earth, which is seen; and just so they are painted. (NTV 114)

There is some controversy, on the basis of this passage, as to whether or not Berkeley takes the retinal image to be the “proper object of sight”; there is controversy, that is, over the question of whether or not a person seeing a man actually sees his own retinal image of the man. However, nothing about the point that Berkeley is most concerned to make in this passage requires that extremely implausible claim. He thinks that the orientation properties of a visible object are determined by its relations to other visible objects and he draws a lesson from this claim. The lesson can be understood by imagining that two people have precisely the same visual experience except that the first’s visual field is inverted both horizontally and vertically with respect to
the second’s. Berkeley is claiming that the objects that each are encountering have all of the same orientation properties. Berkeley makes the rhetorical error of asking one to engage in this thought experiment by imagining a person whose visual field is another’s retinal image. But his point, nevertheless, is clear: if the inversion of one’s visual field does not affect the orientation properties one sees, then there is no meaningful sense in which the retinal image is inverted and so there is no problem to solve.

A few sections earlier, at NTV 111, Berkeley offers the crucial premise in NTV 114’s argument. He writes,

[T]he objects of sight and touch make, if I may so say, two sets of ideas which are widely different from each other. To objects of either kind we indifferently attribute the terms high and low, right and left, and suchlike, denoting the position or situation of things: but then we must well observe that the position of any object is determined with respect only to objects of the same sense. (NTV 111)

Berkeley is making a negative claim and a positive claim. The negative claim is that objects of neither sense modality possess orientation properties with respect to objects of the other sense modality. The positive claim made in the section is that objects possess orientation properties relative to objects of the same sense modality as themselves. The argument of NTV 114 can be construed in such a way that both the negative and the positive claim are required to support it. So understood, Berkeley is arguing first, on the basis of the negative claim, that the tangible retinal image can’t have any orientation properties with respect to the intentional object of the visual experience of the person with that retinal image (that is, the object the person sees), and so can’t be inverted with respect to it; and, at the same time, to be arguing, on the basis of the positive claim, that the visible retinal image is oriented with respect to the visible object encountered, but is not inverted with respect to it. It is in support of this last claim, one might think, that Berkeley notes that “[t]he head which is seen seems farthest from the earth which is seen; and the feet which are seen seem nearest to the earth, which is seen; and just so they are painted” (NTV 114). (Momentarily it will be argued that despite the fact Berkeley notes here, there is little reason to think that the visible retinal image is not inverted with respect to the visible object.) Still, if these claims are true, Berkeley, so construed, has solved the problem, for there is no problem with the orientation of the retinal image if there is no sense in which it is inverted with respect to the visible object that the person sees.

However, there is a way of construing the argument offered at NTV 114 under which it is only the negative claim, and not the positive claim, which is required as a premise. Imagine that visible objects have no orientation properties at all, not even properties arising from their relations to other visible objects; that is, imagine that the positive claim is false. Again, there are two
cases: the term "retinal image," as employed by someone puzzled by its orientation, either refers to a visible or a tangible object. If the term refers to the visible retinal image, then it refers to something that can't be inverted with respect to the visible object the perceiver encounters because it can't be inverted with respect to any other object; if it refers to the tangible retinal image, then it refers to something that can't be inverted with respect to the visible object encountered, for it can be inverted only with respect to some other tangible object. Either way, there is no meaningful problem of the inverted retinal image for there is no sense in which the sentence "My retinal image is inverted relative to what I see" is true. So, we can interpret NTV 114 in such a way that Berkeley doesn't need to claim that visible objects have orientation properties with respect to other visible objects, as he does claim in NTV 111, so long as he also accepts that visible objects lack orientation properties entirely.

The reason this point is important is that when one looks back to a much earlier section of NTV it appears that Berkeley is committing himself to the denial of the positive claim of NTV 111; that is, he seems to deny that visible objects are oriented with respect to one another. Berkeley writes,

[A man born blind], if we suppose him made to see, would not at first sight think anything he saw was high or low, erect or inverted... The objects to which he had hitherto been used to apply the terms up and down, high and low, were such only as affected or were some way perceived by his touch but the proper objects of vision make a new set of ideas, perfectly distinct and different from the former, and which can in no sort make themselves perceived by touch. There is, therefore, nothing at all that could induce him to think those terms applicable to them: nor would he ever think it till such time as he had observed their connexion with tangible objects, and the same prejudice began to insinuate itself into his understanding, which from their infancy had grown up in the understandings of other men. (NTV 95)

Assuming that the man born blind, when made to see, encounters the "proper objects of vision," and assuming that the positive claim made at NTV 111 is to be taken at face value, it would seem to follow that on being made to see the man born blind would be able to recognize a range of orientation properties by comparing visible objects with other visible objects. After all, if visible objects have orientation properties with respect to one another, then why shouldn't the man notice immediately when made to see that, for instance, one of his twin sons is standing on his head and the other is inverted with respect to him. But Berkeley seems, in this passage, to deny that the man born blind has this capacity. Only from correlating visual experiences with tactile, and thus insinuating in himself the prejudice of those born with sight, would the man recognize visible objects to have any orientation properties at all. That is, what Berkeley seems to be claiming is that visible objects lack orient-
tation properties intrinsically, but inherit them from the tangible objects with which we find them to be correlated. In fact, Berkeley makes a big point of this, going on to offer accounts of two different mechanisms through which the man born blind, when made to see, would come to assign orientation properties to visible objects after having tactile experience in conjunction with visual (NTV 97–99). He thinks that such a person would come to assign the property of being above him to a visible object if its movement to the center of the man's visual field is correlated with the feeling of turning his head or eyes upward; and he holds that we could come to assign the orientation properties to a visible object of the tangible object with which we come to find it to be associated.6

Once we note the inconsistency between the positive claim of NTV 111 (namely, that visible objects have orientation properties with respect to other visible objects) and the claim of NTV 95 (namely, that visible objects have orientation properties only secondarily, by virtue of their correlations with tangible objects), then, together with the fact that NTV 111's positive claim need not be construed to play a role in Berkeley's official solution to the problem of retinal image inversion at NTV 114, there is a strong temptation to think that Berkeley is simply slipping on his official view in NTV 111. That is, there is a temptation to say that in his considered moments, Berkeley thinks that visible objects have no orientation properties at all, not even with respect to other visible objects.

In fact, there is yet another reason to take this line: if Berkeley allows that visible objects have orientation properties with respect to other visible objects, then his solution to the problem of retinal image inversion is seriously incomplete, for the visible retinal image—the object one encounters when looking into an eye with the right tools—is inverted with respect to the visible object encountered by the person whose retinal image it is; and this can seem quite puzzling. To see the point, consider a thought experiment: Imagine that we set up a special camera that looks into a subject's right eye and projects his retinal image onto a screen. And imagine that we place that screen in front of the subject's left eye, and in such a way that it cannot be seen by his right and so that it occupies the entire visual field of his left eye. And, similarly, imagine that his left eye cannot see the objects placed before his right. The subject, we can imagine, experiences something like a “split screen”: on the right he sees an object, an arrow say, and on the left he sees his own right eye's retinal image of that arrow. Let's add something else: imagine that the subject also feels his right eye's retinal image (maybe we give him a special drug to make this happen). For him, when looking at an arrow he has the feeling in his right eye similar to that that a normal person has when a cold, arrow-shaped object is pressed against his arm. To put it in Berkeley's terms, the man is encountering three objects: (a) a visible arrow (which he sees with his right eye), (b) a visible retinal image of an arrow (which he sees with his left
eye), and (c) a tangible retinal image of an arrow (which he feels behind his right eyelid).

Now let's accept that there is no fact of the matter about the direction of arrows (a) or (b) when either is compared only with arrow (c); let's accept, that is, the negative claim of NTV 111. (a) and (b) are both visible objects, and (c) is a tangible object, and objects don't, let's assume, have orientation properties with respect to objects of other sense modalities. Still, if visible objects do have orientation properties within their proper sense modality—the positive claim of NTV 111—then it is fair to say that arrow (a) is inverted with respect to arrow (b), and vice versa. If the subject in our experiment thinks this an extraordinary and puzzling fact—which he might, especially when he discovers, for instance, that the orientation of the object he encounters with his left eye changes when the orientation of that which he encounters with his right changes—his puzzlement can't be dispelled by charging him with making an illicit visible-tangible comparison, since he's making no such comparison. Noting that objects lack orientation properties with respect to objects of other sense modalities simply won't quell his puzzlement, for he's not comparing objects across sense modalities at all. So, it seems, if Berkeley allows that visible objects have orientation properties with respect to other visible objects, the problem of retinal image inversion simply doesn't admit of the solution he seems most naturally to be giving it in NTV 114. The solution there seems to suggest that our puzzlement about the orientation of the retinal image will be dispelled by noting the nature of the objects with respect to which visible objects are oriented. But the man in our example is no less puzzled after noting this, so long as he can see that his retinal image is oriented oppositely from the visible object he encounters. Again, it seems, charity requires that we take Berkeley's considered view to be that visible objects lack orientation properties even with respect to other visible objects, despite what he says at NTV 111. If we construe his view this way, then we can say that (a) and (b) are not only not oriented with respect to (c), but neither is oriented with respect to the other. This is a peculiar thing to say—it certainly seems that the man could truly say that the two arrows are pointing in opposite directions—but, at least, it saves Berkeley from inconsistency.

However, Berkeley is under independent and powerful pressure to make the claim that visible objects have orientation properties with respect to other visible objects, the positive claim of NTV 111. The pressure arises from the fact that Berkeley holds that all visible objects, including the "proper objects of vision," have visible magnitude. In drawing the distinction between the primary and the secondary objects of sight, for instance, he writes,

[T]here are two sorts of objects apprehended by the eye, the one primarily and immediately, the other secondarily and by inter-
vention of the former. Those of the first sort neither are, nor appear to be, without the mind, or at any distance off; they may indeed grow greater or smaller, more confused, or more clear, or more faint, but they do not, cannot approach or recede from us. (NTV 50, my emphasis)

It is the primary objects of vision—vision’s “proper objects”—that Berkeley takes to grow larger and smaller, and so he must take the primary objects of vision to have visible size. In fact, Berkeley goes on to explain that a visible object’s visible size is measured by the number of minima visibilia out of which it is constructed (cf. NTV 79–86). But even if we don’t accept that particular theory of the nature of visible size, we must still accept that visible objects do, indeed, have visible size. The reason this is important for our purposes is that, so long as there are distinctions among visible objects, the fact that visible objects have visible size independently of association with tangible objects implies that visible objects have a range of orientation properties with respect to one another. A visible object is visibly above another if it is visibly closer to the visible earth than the other, for instance. In fact, in one expression of his official solution to the problem of retinal image inversion, Berkeley appeals to the reduction of a range of orientation properties to magnitudes relative to a fixed object:

The head, which is painted nearest the earth, seems to be farthest from it: and on the other hand the feet, which are painted farthest from the earth, are thought nearest to it. Herein lies the difficulty, which vanishes if we express the thing more clearly and free from ambiguity, thus: how comes it that to the eye the visible head which is nearest the tangible earth seems farthest from the earth, and the visible feet which are farthest from the tangible earth seem nearest the earth? The question being thus proposed, who sees not the difficulty is founded on a supposition that the eye, or visive faculty, or rather the soul by means thereof, should judge of the situation of visible objects with reference to their distance from the tangible earth? (NTV 113)

The claim, of course, is that only a person who makes illicit visible-tangible comparisons will be troubled by the fact of retinal image inversion. But putting that point aside, it is clear from this passage that Berkeley thinks that (many, if not all) facts about orientation can be reduced to facts about distance from the earth. Since there is a visible earth and there is visible distance, there are facts about visible orientation. Thus, visible objects have orientation properties with respect to one another. Berkeley, then, seems to be under pressure both to accept and to reject the positive claim of NTV 111.

To summarize the interpretive problem just described, consider the following three lines of thought, each of which represents a solution to the problem of retinal image inversion:
First solution:

(1) Visible objects are not oriented with respect to tangible objects, or vice versa.

(2) There is nothing puzzling about retinal image inversion unless one imagines that a visible object is oriented in some way with respect to a tangible or vice versa.

∴ There is nothing puzzling about retinal image inversion. 7

Second solution:

(1') Visible objects are not oriented with respect to tangible objects, or vice versa.

(2') Visible objects are not oriented with respect to one another.

(3') The tangible retinal image is neither inverted nor erect with respect to the visible object seen by the person with that retinal image. (from (1'))

(4') The visible retinal image is neither inverted nor erect with respect to the visible object seen by the person with that retinal image. (from (2'))

(5') There is nothing puzzling about retinal image inversion unless either the tangible or visible retinal image is inverted with respect to the visible object seen by the person with that retinal image.

∴ There is nothing puzzling about retinal image inversion. 8

Third solution:

(1'') Visible objects are not oriented with respect to tangible objects, or vice versa.

(2'') Visible objects are oriented with respect to one another.

(3'') The tangible retinal image is neither inverted nor erect with respect to the visible object seen by the person with that retinal image. (from (1''))

(4'') The visible retinal image is erect with respect to the visible object seen by the person with that retinal image. 9

(5'') There is nothing puzzling about retinal image inversion unless either the tangible or visible retinal image is inverted with respect to the visible object seen by the person with that retinal image.

∴ There is nothing puzzling about retinal image inversion. 10

We've reached the following results: In response to the first solution, one might wonder why (2) is thought true. The thought experiment above, in which a person sees both a visible object and his own retinal image of it, seems
to show that one could get rather puzzled about the fact of retinal image inversion just by confining one's comparisons of orientation to visible objects. The best way to neutralize this worry is to abandon the first solution in favor of the second, and thus deny that visible objects have any orientation properties at all, even relative to one another. The second solution is consonant with what Berkeley says at NTV 95, where he denies that the man born blind and made to see finds the visible objects he encounters to be oriented at all. However, in addition to denying what he seems to explicitly say in NTV 111, and to thereby saddle himself with an intuitively implausible view, if Berkeley were to take this route, he would also have to abandon his view that visible objects have visible magnitude, a view that is deeply entrenched in his theory of vision. Another possibility is to offer the third solution. However, if Berkeley were to take this route, he would have to abandon his view that the blind man made to see finds the visible objects he encounters to lack orientation properties entirely. The question, then, is whether or not there is any way for Berkeley to consistently say all that he does say. As we'll see in the next section, the answer is "yes" for Berkeley's solution to the problem is different from any of the three solutions just discussed.

II.

If Berkeley is offering the following solution to the problem—which, I'll argue, he is—then the interpretive difficulty described can be resolved:

*Fourth solution:*

(1′′′) There is nothing puzzling about the orientation of either the visible or tangible retinal image unless (i) both that retinal image and some visible object that co-occurs with it accurately represent some third object's orientation, and (ii) the retinal image is inverted relative to this co-occurring visible object.

(2′′′) No tangible object has any orientation property relative to any visible object.

(3′′′) . . There is nothing puzzling about the orientation of the tangible retinal image. (since so construed, given (2′′′), clause (ii) of (1′′′) cannot be fulfilled)

(4′′′) If the visible retinal image and the visible object seen by the person who has that retinal image represent anything at all, they do not represent the same thing.

(5′′′) . . There is nothing puzzling about the orientation of the visible retinal image. (since so construed, given (4′′′), clause (i) of (1′′′) cannot be fulfilled)
There is nothing puzzling about the orientation of either the tangible or visible retinal image.

The driving idea of this fourth solution, then, is this: The mere fact that the retinal image is oriented a certain way is not, in itself, problematic. Imagine, for instance, that you had ten coffee cups on a table, all but one of which was inverted. Would this be puzzling? Of course not. The retinal image's orientation is only puzzling because of something about the representational role that we ordinarily take the retinal image to play. However, there is nothing puzzling, even, about a representation being inverted with respect to what it represents because there is no reason to expect representations to have the same properties as what they represent; an image in a mirror, for instance, accurately represents the orientation of what it depicts, despite the fact that it is oriented oppositely. To make a puzzle we still need more: we need the retinal image to be inverted with respect to another accurate representation of the same object. This is what (1") says. The solution to the problem is to show that the visible object with respect to which the (visible) retinal image can be meaningfully said to be inverted does not represent the same thing as that retinal image.

To put the point of the fourth solution another way: Consider the sort of commonsensical position that someone like Locke might advocate: When we see objects we encounter perspectival visual representations of those objects. However, we also learn from some rudimentary study of anatomy and optics that the pattern of light on the retina is inverted with respect to those objects, and also that that pattern is determinative of much about the features of the perspectival visual representations with which we find ourselves. The puzzle is to explain how two things—the retinal image and the perspectival visual representation—could both accurately represent the same object and yet represent it as having different and incompatible properties. The fourth solution dissolves the problem by claiming that one of the objects the term "retinal image" refers to, namely the tangible retinal image, is not inverted with respect to the perspectival visual representation; and the other, namely the visible retinal image, does not represent the same thing as the perspectival visual representation. Either way, then, there's no genuine problem to solve.

If Berkeley has this solution in mind, then the interpretive problem described in section I would be dissolved. Berkeley's discussion at NTV 95 could be taken quite literally: the visible objects encountered by the man born blind who is made to see lack orientation properties of the sort that generate the puzzle because they are not signs of anything else. They become signs of tangible objects as the man moves his head, eyes, and body and learns to correlate visible objects with variously oriented tangible objects, thereby causing
those visible objects to be signs of the tangible. However, this doesn’t imply that they lack orientation properties entirely: they are oriented relative to other visible objects, just as Berkeley says at NTV 111; it’s just that these orientation properties aren’t of any relevance to the puzzle since they aren’t orientation properties of signs relative to other co-signifying signs. When the man born blind is made to see, he finds the visible objects he encounters to be oriented with respect to one another. But, he remains unequipped to be puzzled by the fact of retinal image inversion, for none of the visible objects that he encounters function, for him, as representations of anything else. They inherit their representational role from the correlation of tangible and visible objects, and (perhaps) of visible objects with one another, correlations that, for this man, have not yet been created.

Further, the fourth solution solves the problem of the inverted retinal image even if the retinal image is conceived entirely as a visible object, in the manner of our thought experiment in section I. The man who sees both his own retinal image and the visible object is puzzled by their relative orientations only if he thinks of the visible retinal image of the arrow and the visible arrow to be signs of the same thing. In that case, he’s unsure as to how the object represented is actually oriented: one visible object seems to be telling him one thing, another another. The represented object, he might think, can’t be oriented both as shown by the visible retinal image of the arrow and as shown by the visible arrow. The fourth solution can help the man to relieve his puzzlement by noting that, in fact, the visible arrow and the visible retinal image of the arrow do not represent the same thing. If the visible retinal image represents anything at all, it represents either the visible arrow or the tangible retinal image; but if the visible arrow represents anything at all, it certainly doesn’t represent either itself or the tangible retinal image. The two visible objects are oriented oppositely with respect to one another, of course, but this fact is not puzzling without the conception of them as signs of the same thing.

So, if Berkeley has the fourth solution in mind, then our interpretive problem is solved. But what evidence is there to think that he does? Start by considering what Berkeley says in a series of difficult sections, NTV 116–19, the importance of which has not been appreciated by commentators. Berkeley begins NTV 116 as follows,

[We]hat greatly contributes to make us mistake in this matter is that when we think of the pictures in the fund of the eye, we imagine ourselves looking on the fund of another’s eye, or another looking on the fund of our own eye, and beholding the pictures painted thereon. Suppose two eyes A and B; A from some distance looking on the pictures in B sees them inverted, and for that reason concludes they are inverted in B: but this is wrong.

(NTV 116)
The panels labeled "What B Sees" and "What A Sees" in Figure 1 illustrate what Berkeley has so far described: B sees a visible person (X) and A sees both that visible person and B’s visible retinal image of that person (V_B(X)). What, exactly, is it wrong for A to conclude, according to Berkeley? Evidently, A is wrong to think that “the pictures in B . . . are inverted in B.” But the two most natural interpretations of this claim can’t be what Berkeley has in mind. Berkeley seems to be claiming that “in B” the retinal image is not actually inverted. Interpreted as the claim that B’s visible retinal image (V_B(X)), which
is one of the visible objects that A encounters, is not inverted, the claim is false: $V_B(X)$ is inverted relative to $X$, as A can see. Interpreted as a claim about B's tangible retinal image, the claim is also false: were A to somehow feel B's retinal image he would find it, also, to be inverted relative to the tangible person. So what does Berkeley think it wrong for A to conclude? The passage continues:

There are projected in little on the bottom of A the images of the pictures of, suppose, man, earth, etc., which are painted on B. And besides these the eye B itself, and the objects which environ it, together with another earth, are projected in a larger size on A. Now, by the eye A these larger images are deemed the true objects, and the lesser only pictures in miniature. And it is with respect to those greater images that it determines the situation of the smaller images: so that comparing the little man with the great earth, A judges him inverted, or that the feet are farthest from and the head nearest to the great earth. Whereas, if A compares the little man with the little earth, then he will appear erect, i.e. his head shall seem farthest from, and his feet nearest to, the little earth. (NTV 116)

Berkeley notes that A wouldn't be puzzled if he didn't compare X's orientation to $V_B(X)$'s; those are the only two visible objects A encounters that are inverted with respect to one another. If A were to compare $V_B(X)$ only to other visible objects that he sees inside B's eye, he would not think that $V_B(X)$ was inverted. Further, Berkeley adds that A takes X to be the "true object" and takes $V_B(X)$ to be a representation of it, although he has not yet explained what role that presumption plays in generating A's puzzlement. Further, we have yet to be illuminated as to what Berkeley means in claiming that A is wrong to think that B's retinal image is inverted "in B."

The passage continues:

But we must consider that B does not see two earths as A does: it sees only what is represented by the little pictures in A, and consequently shall judge the man erect. For, in truth, the man in B is not inverted, for there the feet are next the earth; but it is the representation of it in A which is inverted, for there the head of the representation of the picture of the man in B is next the earth, and the feet farthest from the earth, meaning the earth which is without the representation of the pictures in B. For if you take the little images of the pictures in B, and consider them by themselves, and with respect only to one another, they are all erect and in their natural posture. (NTV 116)

What is the importance of the claim that "B does not see two earths as A does?" If Berkeley's solution to the problem of the inverted retinal image were merely to assert that people don't see their retinal images, and so don't notice the discrepancy in orientation between visible objects and signs of them, he
could have said this much earlier and saved his reader this very long discussion. Rather, Berkeley is relying on the following principle: An object (visible or tangible) serves as a representation for a particular perceiver, only if the perceiver perceives it. (Below some textual support is given for thinking that Berkeley has this principle in mind here.) From this principle Berkeley is able to conclude that B's visible retinal image \( (V_B(X)) \) is not, for B, a sign of anything else, since if that were so, B would have to see his own retinal image, which he does not. But if it is not a sign of anything else, it cannot be inverted in any way which could be thought problematic. So, the person who thinks that “the pictures in B . . . are inverted in B” thinks that B's visible retinal image serves as a sign for B of some other object with respect to which it is inverted. But this is wrong, just as Berkeley says, since B's visible retinal image is not, for B, a sign of anything at all. B's tangible retinal image could be considered as a sign, for B, of something else (perhaps B feels his retinal image, however slightly). But B can't have an inversion problem there, since tangible objects aren't oriented with respect to visible. This is why Berkeley immediately reminds us of the heterogeneity of the visible and the tangible, a claim argued for earlier in the NTV:

Farther, there lies a mistake in our imagining that the pictures of external objects are painted on the bottom of the eye. It hath been shown there is no resemblance between the ideas of sight and things tangible. It hath likewise been demonstrated that the proper objects of sight do not exist without the mind. Whence it clearly follows that the pictures painted on the bottom of the eye are not the pictures of external objects. Let anyone consult his own thoughts, and then say what affinity, what likeness there is between that certain variety and disposition of colours which constitute the visible man, or picture of a man, and that other combination of far different ideas, sensible by touch, which compose the tangible man. (NTV 117)

However, it is a mere accident of biology that person B in Berkeley's example does not encounter his own visible retinal image \( (V_B(X)) \), and so it is a mere accident of biology that that does not function, for him, as a representation of anything else. Both the man, A, in Berkeley's example and the man in our earlier example who sees both his visible retinal image of an arrow and the visible arrow, encounters a visible retinal image that, it would seem, functions as a sign for him of another visible object. For A, in other words, B's visible retinal image \( (V_B(X)) \) is a sign of another object \( (X) \) and is inverted with respect to it. Shouldn't A find that strange? No, because for there to be a puzzle about the inverted retinal image there must not be one, but two representations of a single object which are inverted with respect to one another. But A sees only one sign—B's visible retinal image—and one true object that it represents and so doesn't have the materials to make a puzzle. It is as though
A sees a person and that person’s reflection in a mirror; there’s nothing puzzling about that. In fact, even if A considers X to represent something else—he might take X to be a perspectival visual representation of the “real” man, for instance—A would still lack the materials to make a puzzle, for whatever X is taken by A to represent, it won’t be taken by him to represent itself, and so it won’t be taken by him to represent the same thing as he takes $V_B(X)$ to represent (namely X). In fact, in the very next section, we find Berkeley making exactly this point:

[1In the forementioned instance the eye A takes the little images, included within the representation of the other eye B, to be pictures or copies, whereof the archetypes are not things existing without, but the larger pictures projected on its own fund: and which by A are not thought pictures, but the originals, or true things themselves. Though if we suppose a third eye C from a due distance to behold the fund of A, then indeed the things projected thereon shall, to C, seem pictures or images in the same sense that those projected on B do to A. (NTV 118)

So long as we confine consideration to visible objects, A doesn’t conceive X to be a representation of anything else—if he conceives of it as a representation at all, he takes it to represent a “real,” or tangible, object—and so lacks the tools with which to become legitimately puzzled. Even if a third person were to represent what is going on in A, there would still not be any person who sees two signs of one visible object, themselves oppositely oriented visible objects. Referring to the panel labeled “What C Sees” in Figure 1, it seems that C sees four visible objects: a “true” object (X), two representations of it ($V_B(X)$ and $V_A(X)$), and a representation of the first of these representations ($V_A(V_B(X))$). However, since $V_B(X)$ and $V_A(X)$ are oriented in the same way, and since $V_A(V_B(X))$ is not a representation of X but, instead, of $V_B(X)$, there is nothing to become puzzled about.

Couldn’t a person see three visible objects two of which are oppositely oriented and both of which represent the third? Imagine, for instance, that a subject wears a pair of glasses one lens of which inverts the image that passes through it and the other of which is clear glass. The subject has the usual retinal image in, say, his left eye, and an image in his right eye that is oppositely oriented. Imagine that this person has gotten used to his predicament so that he sees what he sees just as you and I do. Now imagine that we have before us the visible retinal image in the subject’s left eye, the visible retinal image in his right, and the visible man that the subject sees. If we take each of the subject’s retinal images to represent the visible man, then we encounter two representations of the man that are oppositely oriented. This is puzzling and it isn’t clear that the puzzlement can be easily dispelled. But, notice, this example does not conflict with, but rather confirms, Berkeley’s point of view as represented in the fourth solution. Unlike the usual case, this case should seem
puzzling—maybe so puzzling, even, as to be impossible. To make sense of how the subject can see the man before him as you and I do we have to imagine that either one of his visible retinal images does not, in fact, represent the man accurately, or that one of the visible retinal images plays no role in generating the subject’s visual experience of the man and, thus, does not represent the visible man at all. Either way, the puzzle of retinal image orientation is puzzling for just the reasons that Berkeley takes it to be and the puzzlement can be dispelled only in one of the two ways that he has in mind.

Berkeley ends the sections under discussion with the following remark:

Rightly to conceive this point we must carefully distinguish between the ideas of sight and touch, between the visible and tangible eye; for certainly on the tangible eye nothing either is or seems to be painted. Again, the visible eye, as well as all other visible objects, hath been shown to exist only in the mind, which perceiving its own ideas, and comparing them together, calls some pictures in respect of others. (NTV i 19)

Here Berkeley seems to emphasize the mind-dependence of all visible objects, and particularly the visible eye. This is a bit odd since a person who is puzzled about the inverted retinal image does not seem to be making the “mistake” of thinking that the eye, particularly the visible eye, lies “outside” the mind. Berkeley doesn’t appear to have ever relied on the claim that visible objects are mind-dependent in order to dissolve the puzzle of the inverted retinal image; it seems that we could accept his solution while holding on to the view that all the objects under discussion are mind-independent. So, why does he emphasize the point here? Or, rather, what point is Berkeley really making? Berkeley’s point here is that only entities that are perceived can function as signs. Only by being “compared” with something else can an object be a sign of that other thing, and only by being perceived can one thing be compared with another. This point, unlike the mere fact that visible objects are mind-dependent, is of immediate relevance to his dissolution of the problem of the inverted retinal image. After all, this is a statement of the principle invoked earlier in our discussion in support of the point that B’s visible retinal image cannot serve, for B, as a sign of anything else: since B doesn’t perceive his visible retinal image he can’t be in position to “compare” it to anything else, and so it cannot function as a sign, for him, of anything else.

Return, momentarily, to NTV 114:

If we confine our thoughts to the proper objects of sight, the whole is plain and easy. The head is painted farthest from, and the feet nearest to, the visible earth; and so they appear to be. What is there strange or unaccountable in this? Let us suppose the pictures in the fund of the eye to be the immediate objects of the sight. The consequence is that things should appear in the same posture they are painted in; and is it not so? The head which is seen seems farthest from the earth which is seen; and the feet
which are seen seem nearest to the earth, which is seen; and just so they are painted. (NTV 114)

Part of what so naturally leads the reader to attribute to Berkeley one of the first three solutions to the problem of retinal image inversion, and thus to encounter the interpretive problem described in section I, is the appearance that NTV 114 contains Berkeley’s full solution to the problem. But we are now in position to see that that is not what NTV 114 offers. The point of the section, as noted before, is that two people who encounter visible objects that are inverted with respect to one another won’t, ipso facto, see things differently from one another. It is tempting to see this as significant because it shows that the retinal image is not, actually, inverted with respect to the visible object that a person encounters. But this is not Berkeley’s real point. Rather, his point is that for there to be a problem about the retinal image’s inversion, we need to have some other visible object to compare it to that is supposed to play the same representational role as that we take the retinal image to play. There is nothing “unaccountable” about the orientation of the retinal image even when it is construed as a visible object if we look only at the orientation properties it possesses by virtue of relations among its parts. It is in the sections following, the sections we have just considered, that Berkeley makes clear what kinds of comparisons are required to create a problem: to become puzzled, we have to consider the retinal image as an accurate representation and compare it with another oppositely oriented visible object that we take to accurately represent the same thing.

Berkeley seems to have realized that he hadn’t presented his solution to the problem of the inverted retinal image with his usual crystal clarity. Immediately following the sections just discussed, he apologizes:

In treating of these things the use of language is apt to occasion some obscurity and confusion, and create in us wrong ideas; for language being accommodated to the common notions and prejudices of men, it is scarce possible to deliver the naked and precise truth without great circumlocution, impropriety, and (to an unwary reader) seeming contradictions; I do therefore once for all desire whoever shall think it worth his while to understand what I have written concerning vision, that he would not stick in this or that phrase, or manner of expression, but candidly collect my meaning from the whole sum and tenor of my discourse. (NTV 120)

More than twenty years later, he took another run at an explanation of the problem in Theory of Vision Vindicated, and reflection on what he says there supports the contention that he is offering the fourth solution. Immediately before introducing the problem, he writes,

Those immediate objects whose mutual respect and order come to be expressed by terms relative to tangible place [that is, visible
objects], being connected with the real objects of touch, what we
say and judge of the one, we say and judge of the other, transfer­
ing our thought or apprehension from the signs to the things
signified: as it is usual, in hearing or reading a discourse, to over­
look the sounds or letters, and instantly pass on to the meaning.
(TVV 48)

Berkeley’s primary concern here is to explain why we take visible objects to
occupy the locations of those tangible objects with which they are correlated.
The explanation that he offers appeals to our mistaken tendency to ascribe
properties to signs that are actually possessed by the things they signify. It is
the same mistake, he goes on to say, that leads one to find the orientation of
the retinal image puzzling. It’s instructive, first, to see how he describes the
problem here:

But there is a great difficulty relating to the situation of objects,
as perceived by sight. For, since the pencils of rays issuing from
any luminous object do, after their passage through the pupil,
and their refraction by the crystalline, delineate inverted pictures
in the retina, which pictures are supposed the immediate proper
objects of sight, how comes it to pass that the objects whereof the
pictures are thus inverted do yet seem erect and in their natural
situation? For the objects not being perceived otherwise than by
their pictures, it should follow that, as these are inverted, those
should seem so too. (TVV 49)

Berkeley puts the problem as one of discrepancy between the orientation of
the retinal image on the one hand, and the orientation the object seems to
have, on the other. That is, he sets up the problem as one involving two modes
of representation of a single object: the object is represented by the retinal
image, and it is represented in appearance, or in the way it seems; that is, it
is represented by a visible object. The problem arises from thinking that the
object is represented as oriented one way by the retinal image and another
by its appearance or corresponding visible object. Berkeley then solves the
problem by demonstrating that it is a mistake to think that these two signs,
the retinal image and the visible object, are legitimately compared with each
other. He claims that the retinal image is a tangible object and goes on to
write:

These tangible images on the retina have some resemblance unto
the tangible objects from which the rays go forth; and in respect
of those objects I grant they are inverted. But then I deny that
they are, or can be, the proper immediate objects of sight. This,
indeed, is vulgarly supposed by the writers of optics: but it is a
vulgar error: which being removed the forementioned difficulty
is removed with it, and admits a just and full solution, being
shewn to arise from a mistake. (TVV 49–50)
Berkeley is not denying that there is such a thing as the visible retinal image. There is such a thing: it is what one sees when one looks into another person's eye or into one's own using proper tools. Rather, his point is that it is the tangible retinal image, rather than the visible, which can be rightly said to be a sign of some other tangible object. This is why Berkeley grants here that the tangible retinal image resembles the tangible object that causes it. In granting this, he is allowing that the tangible retinal image represents the tangible object. But in denying tangible retinal images to be "the proper immediate objects of sight" Berkeley only dispels the puzzlement if he also thinks that the visible object, which he admits to be a sign of the tangible (although not without experience of conjunction of the two), to be only mistakenly compared in orientation to the tangible retinal image. That is, he has only offered a solution to the problem if he denies that tangible and visible objects can be oriented with respect to one another. So, he must be offering the fourth solution here. He has allowed that there is a sense in which both the visible object and the tangible retinal image are signs of the same thing: they are both signs of the tangible object from which light travels to the eye. But he denies that these two signs have any orientation properties with respect to each other. The only object that is oriented oppositely from the visible object is the visible retinal image but that object he denies to be a sign of the relevant tangible object.

Berkeley concludes his discussion in TVV with the following observation:

Pictures, therefore, may be understood in a twofold sense, or as two kinds quite dissimilar and heterogeneous, the one consisting of light, shade, and colours; the other not properly pictures, but images projected on the retina. Accordingly, for distinction, I shall call those pictures, and these images. The former are visible, and the peculiar objects of sight. The latter are so far otherwise, that a man blind from his birth may perfectly imagine, understand, and comprehend them. (TVV 51)

Berkeley's point here is a trivial consequence of a view that he has already expounded at length: namely, the heterogeneity of the visible and the tangible. Every kind of object can be understood, for Berkeley, in this "twofold sense." Pictures are not special in this regard. But the reason Berkeley emphasizes the point here with respect to pictures in particular is that it is peculiarly relevant to the fourth solution: the mistake is in thinking that the retinal image and the visible object are pictures, representations, of one thing and, at the same time, that their orientation can be meaningfully compared. If they are both representations of the same thing—if we are speaking, that is, of the tangible retinal image—then they belong to different sense modalities and can't be meaningfully compared; if they belong to the same sense modality and can be meaningfully compared—if we are speaking, that is, of the
visible retinal image—then they aren’t both representations of the same thing. Either way there is nothing puzzling about the orientation of the retinal image.

III.

in an important paper on this topic, Colin Turbayne marshals persuasive evidence in favor of the claim that Berkeley considers his solution to the problem of retinal image inversion to be an important step in establishing the idealist conclusions for which he argues in *Principles of Human Knowledge*. In particular, according to Turbayne, Berkeley’s solution to the problem of the inverted retinal image is supposed to show that “the proper objects of sight are not the images of external things.”14 This claim is as striking and audacious as idealism itself. If reflection on retinal image orientation forces us to accept that perspectival visual images are not representations of real objects, then the problem of the retinal image is, indeed, a “knot” the solution to which shows us “the principal point in the whole optic theory” (TVV 52). While I believe that Turbayne is absolutely right as to what Berkeley took the importance of the solution to the problem of the inverted retinal image to be, it is not clear from what Turbayne says of the solution itself that Berkeley had any legitimate reason to think this radical idealist conclusion to be implied by his solution to the problem. However, the conclusion of section II places us in position to see why Berkeley should have thought this.

Notice that none of the first three solutions to the problem leads to anything like this audacious conclusion. Consider, for instance, the second solution according to which there is nothing puzzling about the orientation of the retinal image since such puzzlement requires falsely taking visible objects either to be oriented with respect to one another or with respect to tangible objects. Acceptance of the claim that visible objects are not oriented either with respect to tangible or visible objects does not lead to the conclusion that “the proper objects of sight are not the images of external things.” To reach that conclusion we would need the further claim that one thing is an image of another only if oriented with respect to it. But there is no reason to think Berkeley would accept this further claim, or that there is any reason to think it true. In fact, many forms of dualism involve rejection of just this claim: if thoughts about material things adhere in an immaterial substance then, plausibly, they are not oriented with respect to the objects they represent since they are not properly located in space at all.

However, the fourth solution to the problem, the solution attributed to Berkeley in section II, does indeed have the implication that visible objects are not properly (that is, taken independently of experience of conjunction with tangible objects) signs of external things. Imagine that they were. It
would follow that both the visible object one encounters and the visible retinal image that co-occurs with it are representations of the same thing, namely, the “real” object. But then we would have the materials to make a puzzle for we would have two signs of the same thing that are oppositely oriented with respect to each other. Given how Berkeley, in the fourth solution, diagnoses the source of the puzzlement over the orientation of the retinal image, anyone who believes the visible objects he encounters to be, independently of experience, signs of external things will find himself puzzled by retinal image orientation. But since we shouldn’t be puzzled by this, we shouldn’t accept that visible objects are signs of external things.

Why does the conclusion here apply only to the proper objects of vision, the objects of vision considered independently of any tactile experience? That is, why can’t Berkeley use his solution to the problem of the inverted retinal image to establish the stronger conclusion that no visible objects, not even those that have been found through experience to be conjoined with tangible objects, are signs of external things? The reason is that a visible object that has come through experience to be a sign of a tangible object does not represent that object by virtue of the same principles of representation according to which a retinal image represents the object. Thus, the respective orientation of the retinal image and the visible object is no more puzzling than differences found across languages in the words used to represent the same things. It would not be puzzling to find that a pictogram in one language and an inverted pictogram in another represent the same thing. Since the two languages have different principles of representation, there is no problem. Similarly, the fact that a visible object and a corresponding visible retinal image are oppositely oriented is only puzzling if they are words in the same language, so to speak. But a visible object that represents a tangible as a result of experience of conjunction does not represent that tangible object for the same reasons that a particular retinal image does: the visible object represents the tangible because the two co-occur, but it is not that co-occurrence that accounts for the fact that the visible retinal image represents the object, but, instead, the co-occurrence of the visible retinal image and the same tangible object. The analogy to our use of mirrors is instructive: since I’m used to using it, the image in my rearview mirror represents the driver of the car behind me to be sitting on the left-hand side of his car, despite the fact that the image of the driver appears on the right-hand side of the image of the car; when I look over my shoulder, my visual experience represents the driver, again, to be sitting on the left-hand side of his car, although my visual image and the image in the mirror are oppositely oriented. Experience can teach us to employ different rules, depending on the kind of representation we encounter, in collecting the contents of representations.

However, at this point there emerges an obstacle for Berkeley, for why should we agree that the retinal image and the visible object we encounter
do not both accurately represent the same object? Why should we not insist, instead, that those two proper objects of vision are like words in different languages that represent the same thing accurately but which we shouldn’t expect to share the same properties?15 Such a position undermines Berkeley’s audacious claim to the effect that dissolution of the problem of retinal image inversion leads inexorably to an important part of idealism; it allows for dissolution of the problem in accordance with the diagnosis of the problem’s basis provided by the fourth solution without acceptance of the idealist claim. However, the view on offer, according to which the two proper objects of vision represent the same thing but in virtue of different linguistic rules, as it were, encounters a serious problem of its own: there is no reason, other than a desire to avoid Berkeley’s audacious idealist claim, to think that two visible objects could, just by virtue of their nature and independently of experience, represent the same orientation properties while being oriented oppositely. Imagine, for instance, being handed two photographs printed from the same negative, but in which the negative was flipped both horizontally and vertically between making the prints. If the two photographs represent the depicted scene as possessing the same orientation properties, then something must indicate that the one photograph and the other are to be interpreted according to different representational principles, like the two pictograms in two different languages; something must indicate that one, for instance, is to be read in the way we might read the orientation properties of an object while standing on one’s head and looking at an image of it in a mirror, the other in the ordinary way in which we read photographs. But what could possibly indicate this, except something external to the photographs themselves (such as knowledge on the viewer’s part of the original orientation of the subject)? The pictures themselves do not tell the viewer which is to be interpreted in the normal way, and which is to be interpreted as an upside-down photograph of a mirror image; taken by themselves, that is, the two photographs represent the depicted scene as possessing different orientation properties and thus both cannot be accurate. Similarly, to insist that the visible retinal image and the perceiver’s perspectival visual experience represent the object as having the same orientation properties, but do so in virtue of different representational principles, is to insist on something which is, taken by itself, implausible. It is to attribute a greater capacity for representation to visual representations than they have, independently of experience.

Berkeley cared about the problem of the inverted retinal image because he believed that an adequate diagnosis and dissolution of the puzzlement that we sometimes feel about it would lead inevitably to acceptance of the view that the visible objects that we encounter are part of the metaphysical fundament rather than part of the medium through which we learn about that fundament. What is mightily difficult is not accepting the fact of retinal image inversion—nothing easier; the mighty difficulty is in providing an ade-
quate characterization of the root cause of the initial puzzlement that most people feel when confronted with the anatomical facts. What is it that we are commonsensically and falsely assuming about the functioning of our perceptual mechanism that, at first anyway, seems to be in conflict with the fact of retinal image inversion? What we are assuming, if Berkeley is right, is that what we see represents something more, something that lies beyond the sphere of, at least, vision and, perhaps, beyond the sphere of all of our senses. If Berkeley is right, then along with that assumption comes inevitable puzzlement of the sort to which not even a child should succumb. And, thus, with an adult’s savvy about the nature of visual perception comes the acceptance of an important element in idealism.

NOTES

Thanks to Margaret Atherton and James Van Cleve for comments on an earlier draft and to Jim Stoae and Judy Crane for conversations about the paper’s topic.


6. It might be suggested that Berkeley is making a more modest point in NTV 95 than I am suggesting. Perhaps he is saying only that the terms “up” and “down” employed by the man born blind should really be understood as referring to properties more properly termed “tangible up” and “tangible down.” That is, Berkeley might be taken to be claiming only that visible objects can’t be tangibly located, a claim which leaves open the possibility that they can be visibly located. Although this interpretation saves Berkeley from inconsistency, it also loses the spirit of NTV 95 and the sections that follow. Why would Berkeley feel the need to explain how tangible orientation properties come to be assigned to visible objects if he thinks that visible objects have orientation properties of their own?

7. Warnock, for instance, attributes the first solution to Berkeley. See Warnock, Berkeley, 33–34.

8. Lorne Falkenstein and Atherton, for instance, both attribute the second solution to

9. This premise derives from the thought, expressed at NTV 114, that the orientation of the visible man, for instance, is determined by his orientation with respect to the visible earth, while the orientation of the visible retinal image of the man is determined by its orientation with respect to the visible retinal image of the earth. Assessed in this way, both the visible object and the visible retinal image are oriented in the same way; both of their "heads" are closest to the relevant earth.


11. An objection: Couldn’t the retinal image be inverted with respect to another representation of the same object without generating the puzzle? Say, for instance, that the representational content of the retinal image is to be extracted from it by employing different principles than those employed to extract the representational content of the image with respect to which it is inverted. Thanks to James Van Cleve for pressing this objection in conversation. More about this issue in section 3.

12. It might be suggested that Berkeley is proposing, or assuming, a relativist conception of the properties of visibles, or at least of their orientation properties. Perhaps, that is, the claim that "the pictures in B... are inverted in B" is the claim that B’s retinal image has the property of being inverted for B, which, perhaps Berkeley thinks, is a different property from the property of being inverted for A. So understood, A’s mistake is to think that the fact that B’s retinal image has the property of being inverted to A—a property that A can see it to have—means that it has the property of being inverted to B; in fact, we can’t reach any conclusions about what properties a visible has to another perceiver from the properties that it has to ourselves. (Some remarks of Margaret Atherton’s in conversation helped me to see this possible way of construing Berkeley’s point.) Although it is possible that this is what Berkeley has in mind, a failure to recognize the relativity of orientation properties can’t be the root of the puzzle that we sometimes feel regarding the orientation of the retinal image. After all, while in Berkeley’s example A and B are distinct perceivers, this is an accidental feature of the example, as is indicated by our earlier example of a person who sees both an object and his own retinal image. Under this interpretation the man in that earlier example would not be wrong to conclude that his own visible retinal image is inverted in him; he can see that it is. Yet he, too, is making a mistake if he finds his retinal image’s orientation to be puzzling. In addition, as is elaborated in the main text, there is a way of understanding Berkeley’s construal of A’s mistake under which the mistake legitimately leads to puzzlement regarding the orientation of B’s retinal image.

13. Another possibility is that the man somehow interprets the image in his right eye differently from the way he interprets the image in his left. This is the same issue as that raised in footnote 11 and will be discussed in section 3.


15. This is the worry mentioned in footnotes 11 and 13.