

REID ON SINGLE AND DOUBLE VISION: MECHANICS AND MORALS

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ABSTRACT

When we look at a tree, two images of it are formed, one on each of our retinas. Why, then, asks the child or the philosopher, do we not see two trees?¹ Thomas Reid offers an answer to this question in the section of his *Inquiry into the Human Mind* entitled 'Of seeing objects single with two eyes'. The principles he invokes in his answer serve at the same time to explain why we do occasionally see objects double. In Part I of this essay, I examine the principles Reid uses to explain single and double vision. This part is mostly an exercise in the history of cognitive science, but it raises questions of interest to philosophers along the way. In Part II, I turn to a hard-core philosophical problem raised by double vision, namely, whether double vision constitutes an objection to the direct realist theory of perception, which was one of Reid's main philosophical purposes to promote.

I. MECHANICS

Hold a finger in front of your face while focusing your eyes on some more distant object, say a candle on a shelf. While continuing to *focus* on the candle, *attend* to your finger. You will see the finger double, perhaps one copy of it on either side of the candle. Now switch, focusing on the finger while attending to the candle. You will see the nearer object single and the distant object double.

This phenomenon – that the finger will appear double if you look at the candle and the candle double if you look at the finger – was already known to Ptolemy in

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the second century. What accounts for it? Reid offers an explanation that serves to explain two related phenomena as well, giving us three explananda in all:

Why do we normally see objects single despite having two retinal images of them? (IHM: 133; paragraphs 1 & 2)

Why do we sometimes see two Xs when only one X is present? (IHM: 133; paragraph 3)

Why do we sometimes see one X when two Xs are present? (IHM: 133; paragraph 8)

The law of vision to which Reid appeals in answering all three questions is *the law of corresponding points*. The basic idea is this: to each point of either retina, there is a corresponding point of the other; when rays from an object fall on corresponding points, the object is seen as single; when they fall on noncorresponding points, the object is seen as double.

That is not quite how Reid puts it, however. He *defines* corresponding points as points of the retina the stimulation of which produces single vision:

When two pictures of a small object are formed upon points of the *retinae*, if they show the object single, we shall, for the sake of perspicuity, call such two points of the *retinae*, *corresponding points*. (IHM: 133; emphasis added)²

He then lays down as a law of nature a principle specifying *which* points are corresponding:

The two centers of the *retinae* are corresponding points; so are points ‘similarly situate’ with respect to the centers, that is, lying at the same distance and in the same direction from the centers. (IHM: 133; paraphrasing rather than quoting)

Reid thus makes it a matter of *definition* that corresponding points yield single vision and a matter of *law*, to be established empirically, that ‘similarly situate’ points are corresponding in the sense defined. It would be possible to proceed in the opposite manner. That is, one could define corresponding points in geometrical fashion and then let the law be that corresponding points show the object single (that is, when light from the same part of an object falls on corresponding points, that part is seen as single). That is the course taken by Robert Smith, a writer on optics with whose work Reid was familiar:

When the optick axes [lines from the fovea through the pupil] are parallel or meet in a point, the two middle points of the retinas, or any two points

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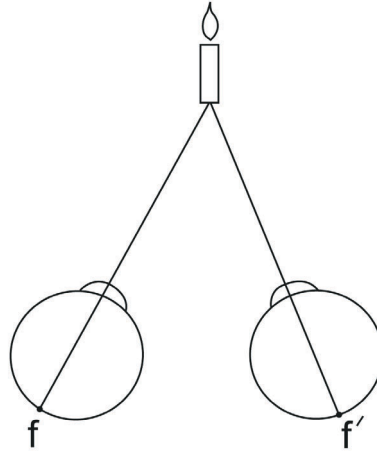


Figure 1.

which are equally distant from them, and lye on the same sides of them either toward the right hand or left hand, or upwards or downwards, or in any oblique direction, are called corresponding points. Now we find by experience that an object or point of an object appears single when its pictures fall upon corresponding points of the retinas, and double when they do not. (Smith 1738; cited in Wade 1998: 226–7)³

It is merely a matter of convention which course we take. Whether formulated Reid’s way as ‘similarly situated points are corresponding points’ or Smith’s way as ‘the stimulation of corresponding points yields single vision’, the empirical content of the law is the same: the stimulation of similarly situated points yields single vision.⁴

How does the law explain the various phenomena? The first thing to be explained is why we normally see single. One case of this is illustrated in Figure 1. Here both eyes are focused on the candle; light from the candle therefore reaches the two foveae, which are corresponding points; the candle is therefore seen as single.

Now let us add a second candle, displaced somewhat to the right from the first, as in Figure 2. Rays from this candle will reach points that lie to the same distance leftward from the fovea. These points are again corresponding points, so the second candle will also be seen as single.⁵

So far we have explained why we normally see single with two eyes. The next thing to be explained is why we do sometimes see double. Figure 3 illustrates what happens when I focus on a candle in the background while my finger is interposed in the foreground.

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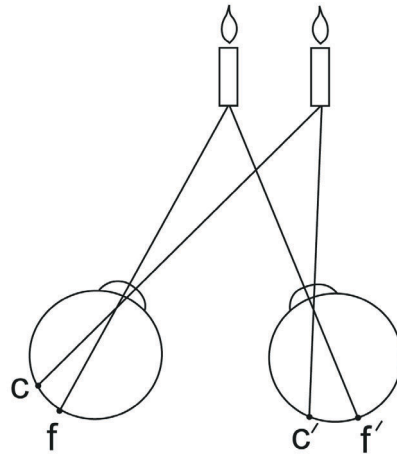


Figure 2.

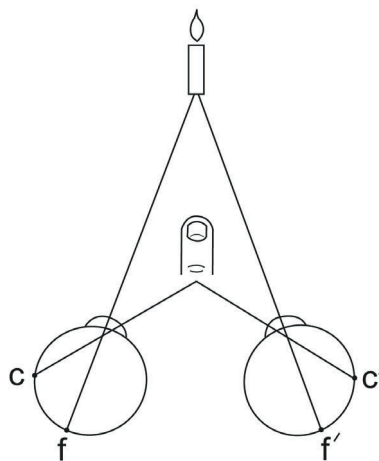


Figure 3.

Rays from the candle reach the two foveas, which are corresponding points, so I see the candle single, just as in Figure 1. But rays from the finger reach points lying in opposite directions outward from the foveas, which are not corresponding points. The finger is therefore seen double, as attention will verify. Were I to focus on the finger instead, it would be seen as single and the candle as double. That is because rays from the finger would then strike the two foveas, while rays from the candle would strike points lying in opposite directions inward from the foveas.

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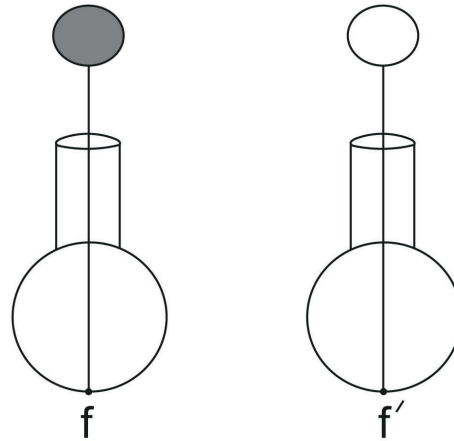


Figure 4.

The last thing to be explained is why we sometimes see two things as one. Reid says this will happen if we view the objects through two parallel tubes, so that each eye receives light from only one object in the pair. Reid writes,

If two pieces of coin, or other bodies, of different colour, and of different figure, be properly placed in the two axes of the eyes, and at the extremities of the tubes, we shall see both the bodies in one and the same place, each as it were spread over the other, without hiding it; and the colour will be that which is compounded of the two colours. (IHM: 136)

I have satisfied myself that Reid is right. I cut out two paper disks, one blue and the other yellow, and viewed them through cardboard tubes, one directed at each disk. I saw a single disk in which a dark bluish gray overlay most of the yellow, somewhat as in an eclipse of the moon.⁶ Figure 4 explains why.

Rays from the two disks strike the foveas (corresponding points) of the two eyes, so they are seen as if united into one. In the absence of the tubes, the eyes would converge on one disk (say, the left one); light from the left disk would reach the two foveas while light from the right disk reaches points similarly situated with respect to the foveas, as in Fig. 2. Two disks would be seen. But with the tubes in place, the two disks are separately foveated, and they are seen as one.

We have now seen how the law of corresponding points explains our three explananda. But what explains the law itself – how are we to account for the remarkable fact that an object striking similarly situated points of the retinas is seen as single? One might naturally think that the nerve fibers proceeding from

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similarly situated points meet at a point further downstream, where some sort of fusion of images takes place. Indeed, various thinkers offered their conjectures about the site of fusion: Roger Bacon suggested the optic chiasm, Descartes the pineal gland, and Newton the sensorium. But this is the sort of thing that Reid would have declined to speculate on, given the knowledge of his day. By Newtonian method as Reid professed it, one may legitimately explain phenomena only by appeal to laws reachable by induction from the phenomena themselves (or other related phenomena). Hypotheses not so reachable are mere hypotheses, unworthy of philosopher:

We laugh at the Indian philosopher, who, to account for the support of the earth, contrived the hypothesis of a huge elephant, and to support the elephant, a huge tortoise. . . . His elephant was a hypothesis, and our hypotheses are elephants. (IHM: 163)

Reid's bottom line on the law of corresponding points, then, is this: 'it must be either a primary law of our constitution, or the consequence of some more general law which is not yet discovered' (IHM: 166).

There is one point about the status of the law of corresponding points, however, on which Reid does take a stand: it is a genuine *law*, the same for all human beings at all times. Single and double vision are 'not the effect of custom, but of fixed and immutable laws of nature' (IHM: 156).⁷ By 'custom' he does not mean social practices or conventions, but individual habits as acquired or modified by association. He is opposed to the view that we must *learn* to see objects single with two eyes.

I think it is worth distinguishing a more and a less radical version of the custom view. According to the less radical view, we originally see fixated objects double and continue to do so until touch corrects vision. This was the view of the eighteenth-century naturalist Buffon:

A second error in the vision of infants arises from the double appearance of objects; because a distinct image of the same object is formed on the retina of each eye. It is by the experience of feeling bodies only that children are enabled to correct this error. (de Buffon 1749, cited in Wade 1998: 254)⁸

What is the nature of the 'correction' to which Buffon refers? Do we continue to see double, but, knowing better, disregard our eyes and believe our hands? Or does the brain somehow change our very percepts, bringing those of sight into agreement with those of touch so that we now genuinely see single when corresponding points are stimulated? I do not know, but I am going to assume that Buffon had the latter process in mind, if only to have a better foil for Reid.⁹

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The more radical version of the ‘we see single by custom’ view holds that prior to associations with touch, there is *no such thing* as seeing single or double. The more radical view says about number what Berkeley said about distance outward in the third dimension: it is not properly a characteristic exemplified in visual fields at all. We learn by association that certain visual appearances are signs that if we walk so far, we will feel such and such, and prior to such learning, we would never dream of applying terms such as ‘near’ and ‘far’ to items in our visual field. Similarly, it is only after we have learned that certain visual arrays signify that we shall *feel* one candle or two (as the case may be) that we *see* one candle or two, and our so seeing simply *consists* in the fact that the visual cue suggests the tangible result.

Perhaps because it is analogous to the view Berkeley unequivocally holds about depth, Reid attributes to Berkeley the radical view about number as well. He says it is Berkeley’s opinion

that we do not originally, and previous to acquired habits, see things either erect or inverted, of one figure or another, single or double, but learn from experience to judge of their tangible position, figure, and number, by certain visible signs. (IHM: 117)

As an instance of this general position,

if the visible appearance of two shillings had been found connected from the beginning with the tangible idea of one shilling, that appearance would as naturally and readily have signified the unity of the object, as now it signifies its duplicity. (IHM: 116)

I find the more radical view incredible, but fascinating and worthy of further probing.

Berkeley is famous for giving an answer of *no* to Molyneux’s question: would a man born blind made to see recognize by sight alone cubes and globes that he had previously been able to recognize by touch? If Reid is right in attributing to Berkeley the radical view about number, Berkeley should also give an answer of *no* to the numerical variant of Molyneux’s question: would a man born blind and made to see recognize by sight alone single dots and pairs of dots that he had previously been able to recognize (as Braille readers can) by touch? Indeed, on the radical view, the man given sight for the first time would not even *understand* the meanings of ‘one’ and ‘two’ as applied to items in his visual field.

If Berkeley did indeed take the radical line about number, I would submit the following objection: do you not admit that a circle is a visibly different figure from a figure eight? Yet what can the visible difference consist of, if not the fact that one figure contains two circles and the other only one?¹⁰

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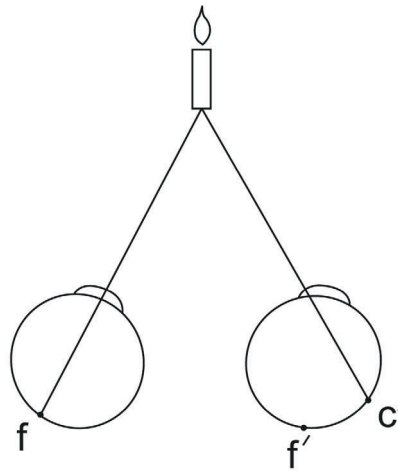


Figure 5.

Reid's own objection to the 'custom, not nature' view is not the one I have just raised. He does not single out the radical line for special criticism, but raises instead an empirical objection that applies equally to the Berkeleian and Buffonian views.¹¹ The objection is based on the following principle:

It may be taken for a general rule, That things which are produced by custom, may be undone or changed by disuse, or by contrary custom. On the other hand [that is, taking the contrapositive], it is a strong argument, that an effect is not owing to custom, but to the constitution of nature, when a contrary custom, long continued, is found neither to change nor weaken it. (IHM: 154)¹²

He then goes on to argue that in fact there are no well substantiated cases of double vision giving way to single solely because of contrary custom. Repeatedly feeling one thing when we see two is not enough to make us eventually see one.

A problem for Reid in this connection is posed by *squinters* – individuals whose misaligned eyes do not properly focus on the same object. If Reid is right, it appears to follow that squinters should see double all their lives, since in their case rays from an object *never* fall on corresponding points (see Figure 5).

Yet they do *not* see double all their lives, as Reid well knows.¹³ What gives?

The answer, in a nutshell, is that Reid believes squinters become functionally blind in one eye. The law of corresponding points implies that squinters will always see double only in conjunction with an auxiliary assumption, namely, that they continue to have vision in each eye. Reid upholds the law by casting doubt on the auxiliary assumption. He identifies various possible causes for loss of vision

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in the squinting eye (for example, the line of sight from the deviant eye might be blocked by the nose, or habitual disregard of images received by the squinting eye might lead to what is nowadays called ‘inattentional blindness’.) He then goes on to summarize the results of his own examination of over twenty persons who squinted, reporting that he did indeed find in each of them some defect of vision in the squinting eye (IHM: 148).

Reid’s conclusion (after seven sections devoted to squinting!) is this: ‘That, by an original property of human eyes, objects painted upon the centres of the two *retinae*, or upon points similarly situate with regard to the centres, appear in the same visible place’ – that is, as single. This property ‘must be either a primary law of our constitution, or the consequence of some more general law which is not yet discovered’ (IHM: 166).

A question that may occur to some of Reid’s readers is this: granting that it is part of our constitution (and not simply a matter of custom) that we see objects single when they stimulate corresponding points and double when they do not, why must this be a matter of unbreakable law rather than of defeasible tendency? Why could the principle of single and double vision not be modeled on Reid’s principle of credulity, which says that for the good of the species, children have an innate tendency to believe everything their parents and guardians tell them, but that as they grow wiser in the ways of the world, this tendency gets modified and weakened?¹⁴ Such a principle would imply (agreeing with Reid) that it is our original condition to see single when our two eyes are focused on one object (or double when we have squinting eyes), but it would allow (contrary to Reid) that we might alter that condition in the face of conflicting information from other senses.

The answer, I conjecture, is this: Reid’s principle of credulity is a principle about what we *believe*, while the law of corresponding points is a principle about what we *perceive*. Belief is typically more plastic than perception.¹⁵ The principle of credulity, though unlimited in children, is weakened as they grow older and meet with instances of deceit and falsehood. By contrast,

Let a man look at a familiar object through a polyhedron or multiplying-glass every hour of his life, the number of visible appearances will be the same at last as at first: nor does any number of experiments, or length of time, make the least change. (IHM: 156)

This passage highlights the fact that for Reid, perception is not (as it is for some theorists) simply a matter of belief acquired through the senses. There must be something other than believing that constitutes seeing, since I continue seeing two after I have ceased believing in two. Reid tells us that one of the essential ingredients in perception is the mental act he calls *conception*, and his discussion of double vision gives us reason to think that conception is not a belief-like state.

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In my view, it is more akin to what Russell calls *acquaintance* – but that is an issue for another occasion.¹⁶

II. MORALS

What philosophical morals might be drawn from the phenomenon of double vision?

One moral is that we are often in some sense blind to things we are at the same time in some sense definitely presented with. Reid writes as follows:

Thus you may find a man that can say with a good conscience, that he never saw things double all his life; yet this very man, put in the situation above mentioned, with his finger between him and the candle, and desired to attend to the appearance of the object which he does not look at, will, upon the first trial, see the candle double, when he looks at his finger; and his finger double, when he looks at the candle. Does he now see otherwise than he saw before? No, surely; but he now attends to what he never attended to before. The same double appearance of an object has been a thousand times presented to his eye before now; but he did not attend to it; and so it is as little an object of his reflection and memory, as if it had never happened. (IHM: 134)

Two philosophers who are otherwise admirers of Reid, Taylor and Duggan, find this passage shocking. They call it ‘an outrage against the common sense which it was the general purpose of his philosophy to confirm’ (Duggan & Taylor 1958: 171). I think it should be regarded instead as illustrating a phenomenon that is surprising at first, but easily accepted once several instances of it have been pointed out: ‘that the mind may not attend to, and thereby, in some sort, not perceive objects that strike the senses’ (IHM: 135). Contemporary psychologists have studied other instances of this phenomenon under the heading ‘inattentional blindness’ (Mack & Rock 1998). Much more needs to be said about it, as it is matter of some delicacy to determine in what sense you are aware of the unattended item and in what sense you are not. I shall leave these matters for another occasion, however, and pass on to a second possible moral of double vision that looms larger for Reid’s philosophy.

Reid is a champion of direct realism – the view that perception puts us in direct cognitive contact with things in the external world.¹⁷ Among his opponents on this score is Hume, who holds that the objects of perception are always mind-dependent images or ideas. Here is one of Hume’s arguments for the opposing view – in fact, the only argument he gives for it in the pivotal section I.iv.2 of the *Treatise*:

When we press one eye with a finger, we immediately perceive all the objects to become double, and one half of them to be remov’d from their common

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and natural position. But as we do not attribute a continu'd existence to both these perceptions, and as they are both of the same nature, we clearly perceive, that all our perceptions [i.e., all the things we perceive] are dependent on our organs, and the disposition of our nerves and animal spirits. (THN: 210–211)

It is remarkable that Reid never addresses this argument. He explicitly undertakes to refute another of Hume's arguments against direct realism (the argument in Section XII of *An Enquiry into Human Understanding* concerning the table that diminishes in apparent size as we retreat from it),¹⁸ and he was well aware of the phenomenon of double vision (he gives a safer and more reliable method than Hume does for inducing it). Yet he never takes up the question how direct realists should respond to the argument above. In the remainder of this section, I set out the argument in step-by-step fashion and canvass possible replies on Reid's behalf.

When you attend to your finger while focusing on something in the distance,

1. You see two fingery objects.
2. There are not two (existent) physical fingers before you. Therefore,
3. a. You see at least one fingery thing that is not an (existent) physical finger.
b. It is a mental finger – a fingery image or sense datum existing in your mind.
4. The other fingery object you see is (as Hume says) 'of the same nature' as the mental finger (i.e., is phenomenologically just like it). Indeed, every finger you have ever seen is of the same nature as the mental finger
5. Items that are phenomenologically just alike have the same ontological status. (Ontology recapitulates phenomenology, to echo an old slogan.)
Therefore,
6. Every finger you have ever seen has been a merely mental finger.
Generalizing: you have never seen any objects in the physical world, but only mental images of them.

When I speak of 'seeing' in this argument, I mean *direct* seeing – being acquainted with the thing itself and not merely with some intermediary from which you infer its existence.¹⁹ With 'seeing' so understood, the conclusion is acceptable to indirect realists, but anathema to Reid.

If we wish to resist the conclusion, which step in the argument should we challenge?

We should not balk at generalizing the conclusion in step 6. There is no plausibility in the thought that direct realism fails for fingers, but manages to work somehow for toes or tomatoes. Let us therefore look for a step to deny higher up.

Step 5 in the argument is denied by the philosophers nowadays known as *disjunctivists*.²⁰ Suppose we feel compelled by the first half of the argument to say that at least one of the things you see in a case of double vision is a mental finger. Must we therefore say that the other fingery object you see

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(or the single fingery object in a case of single vision) is likewise a mental object? Disjunctivists say no. Even if everything about the experiences of two objects is just the same qualitatively or from the inside, that does not mean that we must give the two experiences the same ontological assay.²¹ One of the experiences may have a mental finger for its object while the other experience, though phenomenologically indistinguishable from the first, has a flesh and blood finger for its object. Same phenomenology, different ontology.

Disjunctivism is hotly debated these days, and I cannot begin to do it justice in a paragraph or two. I will simply record here my conviction that it is not the best way out of the predicament posed by double vision, nor Reid's way out, and move on.

Step 4 in the argument says that the second finger in a case of double vision is phenomenologically indistinguishable from the first. This, too, has been challenged. Merleau-Ponty cites a wealth of examples to show that in typical cases of hallucination, the victim is able to distinguish hallucinatory experiences from their veridical counterparts. (Merleau-Ponty 1962: 334–45; especially 334 and 339).²² Can we say the same about the experiences of the two fingery objects in double vision?

It does generally seem to me that one of the two fingery objects looks more *substantial* than the other. In corroboration of this, the reader may wish to try the following 'touch test', proposed to me by Brian Glenney. Induce double vision by Reid's method – hold up a finger and focus afar while attending near. Ask yourself which finger looks more substantial; then try to touch the tip of each finger in turn with a pencil. I find that when I try to touch the more substantial finger, I successfully make contact: I feel the pencil with my finger, and I seem to see two pencils touching two fingers. But when I try to touch the less substantial finger, I make no tangible contact, and I seem to see a pencil waving right through the space visually occupied by the finger. I take this to confirm that one of the fingery objects really does look more substantial than the other. If it did not, how could I reliably produce as desired either the experience of touching a pencil to a finger or the experience of passing a pencil right through a finger?

We could deny step 4, then, and insist that phenomenology does enable us to distinguish the fingers – one is flesh, the other phantom. I would be uneasy, however, if we could stop the argument nowhere but at step 4. Even if hallucinated objects and second objects in double vision are *in fact* typically less substantial or vivid than veridically seen objects, it seems to me *possible* that a hallucinated object should duplicate a perceived object in all phenomenological respects. With suitable adjustments in the other premises, one could still argue that the objects of veridical perception must belong to the same ontological category as whatever objects are needed to account for these possible cases.²³

Moving up in the argument, we come next to premise 3, which I have split into two parts. The first part, 3a (you see at least one thing that is not an existent

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physical finger), follows from 1 and 2, so it cannot be denied unless we are prepared to deny one of them as well.²⁴ But 3b (you see at least one thing that is a mental finger) does *not* follow from 1 and 2. There are two camps of philosophers who would deny it, each in its own way: the American New Realists of the early twentieth century and some of the followers of Meinong.

Step 3b says that at least one of the fingery things you see exists only in your mind. The New Realists deny this because in their view, *both* of the fingery objects you see are externally existing physical and finger-like objects, even if at most one of them is (or is part of) a flesh and blood finger. Their strategy is to locate the objects some would regard as intra-mental sense data right out there in the physical world – they crowd the world with colors seen only under certain lights, shapes seen only from certain perspectives, and even the visual aspects of the drunkard’s pink rats. As the title of a piece by one of their exponents has it, ‘The Real World is Astonishingly Rich and Complex’ (Sinclair 1973: 647–54).²⁵ They avoid being trapped behind the veil of ideas by systematically according to the objects of perception, even in cases of illusion or hallucination, *bona fide* existence in the external world.²⁶

On one point, Reid’s views display some affinity with those of the New Realists. He distinguishes the visible figure of an object from its real figure:

[A]s the real figure of a body consists in the situation 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. (IHM: 96)

As an example of visible figure, Reid mentions the elliptical shape of a round plate viewed obliquely (IHM: 95). Now is visible figure merely an impression or an idea in the mind? No, Reid says, for ‘it is extended in length and breadth; . . . and therefore unless ideas and impressions are extended and figured, it cannot belong to that category’ (IHM: 98). On the contrary, ‘[T]he visible figure of bodies is a real and external object to the eye’ (IHM: 101). Perhaps, then, Reid would say that when you see double, what you see are two visible figures, both of them existing in the space external to the eye. If the rest of the argument goes through unchallenged, all objects of vision would be such figures.

A possible development of this position would be that visible figures are generally (though not always) parts of the surfaces of physical things like fingers and tables, and that one can see a finger in virtue of seeing its facing surface or some part of it. For better or for worse, however, Reid’s views about the geometry of the visual field make this strategy unavailable to him. Reid believes that the familiar geometry of Euclid holds for tangible figures, but not for visible figures; for example, the tangible surface of a rectangular tabletop has an angle sum of 360 degrees, but any visible rectangle will have an angle sum greater than 360 degrees. It follows that what I see when I look at my tabletop cannot be part of its surface.

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I have aired elsewhere the worry that Reid's views on the geometry of visibles may compromise his direct realism.²⁷ The worry is not that we are trapped behind a veil of ideas, for Reid's visible figures are external things and not ideas. It is rather that Reid must say that we see a table only by seeing something else that is not even a part of it, and in one good sense, that means our visual perception of tables is not direct. Perhaps this is where Reid would let the matter lie, but I would prefer to find in his philosophy a more direct realism if I can.

I turn now to the Meinongian way of denying 3b. Meinong's signature doctrine is that the totality of objects includes objects that do not exist (Meinong 1960: 76–177). This opens up a new option for denying 3b: having agreed in 3a that you see at least one fingery thing that is not an existing physical finger, Meinongians need not say that it is an *existing mental* finger (an image or sense datum); they may say instead that it is a *nonexisting physical* finger. This, at any rate, is the sort of thing that Meinongian philosophers say about cases of hallucination. When Macbeth hallucinated his dagger, there was indeed an object that he was aware of – a dagger, located at some point in physical space before him – but unlike a veridically seen dagger, it was a dagger that did not exist.²⁸

Interestingly, Reid himself is sometimes seen as a precursor of Meinong, at least as regards the objects of conception. In the essay on conception in the *Essays on the Intellectual Powers of Man*, he tells us that one of the peculiar features of conception (otherwise known as simple apprehension) is this:

[I]t is not employed solely about things which have existence. I can conceive a winged horse or a centaur, as easily and as distinctly as I can conceive a man whom I have seen. (EIP: 310)

Reid goes on to insist that when you conceive of a centaur, it really is a *centaur* that you conceive of – not the *idea* of a centaur or any other mental intermediary. Conception is an act of the mind that may relate a thinker directly to a nonexistent object.

Can we bring Reid's Meinongian views into his theory of perception? Precisely that has been advocated in an interesting interpretation of Reid developed by Phillip Cummins. According to Cummins, perception itself, in virtue of having conception as its core cognitive ingredient, inherits the distinctive Meinongian property of conception: it may have nonexistent objects (Cummins 1974: 317–40).²⁹ If that is right, it is possible to hold that what you see in a case of normal or veridical vision and what you see in a case of doubled or distorted vision is the same thing – a finger, say, or a bent stick – but in the former case it exists and in the latter it does not. There is no need to posit special mental objects to be the objects in the nonveridical case, and therefore no danger that the mental objects, like the camel that got its nose under the tent, will take over.

Since it affords an intriguing solution to a difficult problem, the Meinongian approach merits serious consideration. When all is said and done, however, it

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remains hard to believe that there can be cognitive or intentional relations between thinkers and utterly nonexistent relata. It is *so* hard to believe that even some who call themselves Meinongians do not really believe it. A case in point is provided by A. D. Smith in his richly detailed defense of direct realism, which incorporates what Smith bills as a Meinongian solution to the problem of hallucination (Smith 2002; especially chapter 9). In Smith's view, the objects of hallucination and veridical perception alike are *intentional objects*, which may or may not exist. In the case of hallucination, they do not exist; in the case of veridical perception, they do, and are identical with real objects in the environment. It is through this identification that Smith seeks to secure direct realism. (He does not seem to be aware that the solution he advocates has also been attributed to Reid, whom he criticizes in an earlier chapter for holding a different view.)

Although he assumes a Meinongian mantle, it seems to me that Smith is not really a Meinongian. A genuine or hard-core Meinongian would hold that there can be cognitive relations to the nonexistent. But Smith denies that having an intentional object is standing in a relation to anything (Smith 2002: 242); he holds instead that the fact that an experience has such-and-such an intentional object supervenes on purely phenomenological or qualitative facts about the experiencer (Smith 2002: 257). In other words, a statement assigning an intentional object to *a*'s experience has the logical form '*Fa*' rather than the form '*aRb*'. To hold that, it seems to me, is essentially to abandon Meinongianism and opt instead for an adverbial theory, such as I discuss a few paragraphs below.

The next step in the argument to be considered for rejection is step 2: there are not, when you see one upraised finger double, two existing physical fingers before you. By physical fingers, I mean flesh and blood fingers, not the physical, fingery things believed in by the New Realists. When this step is properly understood, I know of no one who has seriously suggested denying it.³⁰

That brings us at last to step 1: when you see your finger double, you see two fingery objects. That may seem obvious, but there are philosophers who would find it the most questionable step of all.

To motivate the denial of premise 1, let us consider an argument against direct realism to which the argument from double vision may instructively be assimilated: the argument from illusion. One version of it runs thus:

1. When I view a sheet of white paper under red lights, what I see is pinkish.
2. The sheet of paper is not pinkish.
3. Therefore, what I see is not the sheet of paper (but only a pinkish sense datum, etc.: the argument continues roughly as in 3b through 6).

Here many philosophers will want to deny the first premise. It is not true that what I see *is* pinkish; what I see (= the sheet of paper) only *looks* pinkish. Moreover, the paper can look pinkish without having to place before my mind a proper object of visual awareness that really is pinkish, like a classical sense datum.

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How is looking pinkish to be analyzed, if not in terms of the classical sense-datum analysis? There are two main options. *Adverbial* theorists say that an object looks F when it causes the subject to sense F-ly, where sensing F-ly is a monadic state of the subject rather than a relation to an inner sensory object.³¹ *Intentional* theorists say that an object looks F when it causes a subject to represent the object as being F, where representing is a state with propositional content.³² Theorists of either persuasion may go on to say that the core component of seeing an object is its looking some way to you.

If either of these options is a satisfactory response to the argument from illusion, why not also to the argument from double vision? The parallel response to the argument from double vision would run along the following lines: when you see double, it *looks* as though there are two fingers before you, but that does not mean there actually are two fingery somethings that you are aware of. Just as you can see a white sheet of paper that looks pink without having to see anything that really is pink, so you can see a single finger that looks double without having to see two of anything.

The adverbial theory and the intentional theory admittedly both need further development as applied to appearances of unity or duplicity. What exactly does it mean to say that someone is sensing two-ishly? Or that someone is representing an object as being two? We can perhaps make some headway with this problem by swapping it for another, given the equivalence, recognized by Reid, between seeing an object as single or double and seeing it as being in one place or two (IHM: 135, 138, 157–158, 166 & (from an undated manuscript) 329–30). Under the swap, we would need from the adverbialist an account of what it is to sense an object ‘here-ishly’ or ‘there-ishly’ and from the intentionalist an account of what propositional content is involved in representing an object as being at a certain place or places.³³ It would be nice as well to have from each theorist an answer to the question: what, if anything, do you have to add to *x looks some way to S* to get *S sees x*?

Would either the adverbial or the intentionalist strategy have been open to Reid? Arguably, yes. Some have interpreted him as an intentionalist (Copenhaver forthcoming). I have reservations about this, but I lack the space to address that interpretive issue properly. Others have attributed to him an adverbial theory of sensation – sensing is a nonintentional state, a matter of sensing some *way* and not of sensing some object or fact. This attribution I believe to be correct, but of limited help in connection with the present issue. That is because Reid thinks that sheer sensation can never present an extended expanse or an object at a certain location. He thinks it is only *conception* that presents us with objects having any spatial attributes (IHM 62–7). If so, to have an adverbial account of double vision, we would need an adverbial account not just of sensation, but of conception as well. I am not sure whether such an account is possible or what form it would take.

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I have canvassed several responses to the argument from double vision without making a definite choice among them – that is a task I must leave for another occasion. But I want to close by presenting a consideration that convinces me that there must be *something* wrong with the argument, even if it does not conclusively show what. Psychologists have experimented with displacing lenses – lenses that make a spoon or a fork appear to be a foot to the right of where it really is, so that a subject not yet accustomed to the lenses will reach in the wrong place to pick it up. The standard argument from illusion, applied to such cases, would have it that what the subject sees is not the spoon, since the spoon is at one place and what he sees is at another. Here I have not the slightest temptation to agree. What I see is not some pseudo-spoon located in a different place from the real spoon; it is the real spoon, located at one spot on the table but appearing a foot to the right. That it appears to the right of where it is does not mean that it is not the spoon itself that I see.

Now vary the experiment by giving me lenses that make the spoon appear simultaneously to the right and to the left of where it really is – in other words, give me double vision. If the first experiment does not compel me to renounce direct perception, then neither should the second. Reid’s direct realism can stand up to the challenge of double vision.³⁴

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NOTES

- ¹ See Matthews, Gareth (1980) *Philosophy and the Young Child*, Cambridge, MA: Harvard University Press, pp. 8–10, for an account of how this problem presented itself to an eight-year old boy.
- ² On p. 161 in the edition of Reid's *Inquiry* edited by Timothy Duggan (Chicago: University of Chicago Press, 1970), there is a serious typographical error in this passage: the plural 'retinae' in Reid's definition is rendered as 'retina'. This could lead one to the mistaken belief that corresponding points lie on the *same* retina.
- ³ Robert Smith (1738) *A Compleat System of Opticks in Four Books*; quoted in Wade (1998: 266–67).
- ⁴ The same duality of approach is still to be found in contemporary textbooks on vision. In Stephen E. Palmer (1999) *Vision Science*, Cambridge, MA: MIT Press, corresponding points are defined geometrically (as in Smith): 'positions that would coincide if the two foveae were superimposed by simple lateral displacement' (p. 207). In Maurice Hershenson (1999) *Visual Space Perception*, Cambridge, MA: MIT Press, corresponding points are defined functionally (as in Reid): 'points (one in each eye) that produce the perception of a single visual direction' (p. 24).
- ⁵ Reid discusses this case in the paragraph numbered 2 on p. 133. He stipulates that the second candle 'stands at the same distance from my eyes' as the first. What does he mean by that? Gideon Yaffe ('Reid on Consciousness and Attention', forthcoming) considers two possibilities: at the same distance from *one* of the eyes versus at the same distance from the *midpoint* between the eyes. If he means either of these things, however, he is wrong, simply as a matter of geometry: rays from an object so placed will not strike similarly situated points. I at first took Reid to mean yet something else: that the second candle is at the same perpendicular distance as the first from a line connecting the eyes (as when it lies further to the right on a shelf that is parallel to that line). In that case, too, he would be mistaken about the geometry of the situation, but his mistake would be a venerable one. At issue here is the shape of the *horopter*, to use the term introduced in the 1600s for the locus of all environmental points in the horizontal plane of the eye that project to similarly situated points of the retinas. For some centuries after Ptolemy, it was assumed that the horopter is a straight line passing through the fixation point and running east and west if the nose is pointing north. This seems to have been assumed by Porterfield, one of the writers Reid cites, as late as 1737, and I think it possible that Reid held the same view. (See p. 275 of Wade (1998) for a quotation from Porterfield.) In the early 1800s (but why not earlier?), it was discovered that the horopter is actually a circle containing the fixation point and the optical centers of the two eyes. (This is what is called the 'theoretical horopter' or the 'Vieth-Mueller circle' in Palmer (1999), p. 208.) It is hard to tell from Reid's text what he actually believed about the horopter; it is possible that he had the same mistaken view as Porterfield. But he was right about at least this much: there *is* a horopter, i.e., a line or curve at any place along which an object will be seen single.
- ⁶ I do not know what Reid meant by a color 'compounded' of the two colors; I did not see green.
- ⁷ Several pages earlier, at p. 152, he introduces this topic by saying 'It remains to be considered, whether that correspondence between certain points of the *retinae*, which is... necessary to single vision, be the effect of custom, or an original property of human eyes?' His answer is the latter. According to Michael Morgan (1977) *Molyneux's Question*, Cambridge, MA: Cambridge University Press, p. 106, Reid was the first to hold that the correspondence of retinal points is fixed by nature.
- ⁸ Comte de Buffon (1749) *Histoire Naturelle générale et particulière*; quoted in Wade (1998: 254). The first 'error', incidentally, is seeing objects upside down because the

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images of them on our retinas are inverted. Reid thinks we never make either error. His views on erect and inverted vision run parallel to his views on single and double vision: we originally see both erect and single owing to laws of our constitution. For further discussion, see James Van Cleve (2003) 'Reid Versus Berkeley on the Inverted Retinal Image', *Philosophical Topics*, 31, pp. 425–55.

- ⁹ There are other possibilities as well. On a pure belief theory of perception, such as that advanced in D.M. Armstrong (1968) *A Materialist Theory of the Mind*, London: Routledge, a change in what we believe in response to visual stimulation would *be* a change in what we perceive – no need for the brain to muck around with any percepts.
- ¹⁰ I doubt myself that Berkeley does take the radical line that Reid attributes to him. At NTV 108 he says this: '[D]iversity of visible objects does not necessarily infer [imply] diversity of tangible objects corresponding to them. . . . I should not therefore at first opening my eyes conclude that because I see two [legs] I shall feel two. How, therefore, can I, before experience teaches me, know that the visible legs, because two, are connected with the tangible legs?' Here Berkeley is granting that the premise, *I see two legs*, is available prior to learning correlations between vision and touch. It is only the drawing of the conclusion, *I shall feel two legs*, that requires learning.
- ¹¹ Another writer to whom Reid ascribes the 'custom' view is 'the judicious Dr Smith', author of the optical treatise cited in note 3. At *Inquiry*, p. 153, he says that Smith 'agrees with Bishop Berkeley in attributing [single vision] entirely to custom'. But Reid evidently does not ascribe to Smith the radical version of the custom view he ascribes to Berkeley. In his unpublished manuscripts, he speaks of Smith's view that we 'naturally see things double but by use come to judge them single' (p. 330 of the Brookes edition of the *Inquiry*; see also p. 270). That would put Smith in the company of Buffon rather than Berkeley.
- ¹² According to William James, Reid's principle gained notoriety through its use by Helmholtz; see William James [1890] (1950) *The Principles of Psychology*, New York: Dover Publications, Volume. 2, p. 218.
- ¹³ 'I know no instance of double vision [in squinters] that continued for life, or even for a great number of years' (IHM: 144).
- ¹⁴ I owe this suggestion to Jack Sanders. For Reid's discussion of the principle of credulity, see *Inquiry*, Chapter 6, Section 24, especially p. 194.
- ¹⁵ Perhaps one cannot say this about *all* beliefs for Reid. Some of the beliefs in what he calls 'first principles' may be as unshakeable as any perception.
- ¹⁶ Reid often characterizes perception as involving two components, a conception of the object perceived and an immediate (noninferential) belief in the existence of the object. Our current reflections on double vision suggest not only that the conception component is something un-belief-like, but also that the belief component itself need not always be there. For further discussion, see James Van Cleve (2004) 'Reid's Theory of Perception', in Terence Cuneo and Rene van Woudenberg (eds.) *The Cambridge Companion to Reid*, Cambridge: Cambridge University Press, pp. 101–33, especially sections III and IV.
- ¹⁷ For more on what direct realism means and how Reid tries to secure it, see 'Reid's Theory of Perception', cited in note 16.
- ¹⁸ See 'Reid's Theory of Perception', pp. 103–04.
- ¹⁹ Like Reid, I tend to think that nothing but direct seeing is worthy of the name. ('Astronomers see new extra-solar planet', proclaims a headline, but the story reveals that what they really observed were perturbations in neighboring bodies, which they explained by hypothesizing the existence of the planet. I protest this use of the word 'see'.) For further discussion of Reid's attitude on this point, see 'Reid's Theory of Perception', pp. 123–24.
- ²⁰ An early expression of disjunctivism is John MacDowell (1988) 'Criteria, Defeasibility, and Knowledge', in J. Dancy (ed.) *Perceptual Knowledge*, Oxford: Oxford University

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Press, pp. 209–19. The doctrine is so called because it affirms that veridical experience and hallucinatory experience have nothing in common but such disjunctive characterizations as ‘either seeing a real external finger or seeing a mental finger’.

²¹ Note that premise 5 might take either of two forms, depending on the argumentative context: (i) objects phenomenologically alike must have the same ontological status, or (ii) experiences phenomenologically alike must be given the same ontological analysis.

²² Thanks to Rebecca Copenhaver for bringing this passage to my attention.

²³ See chapter 7 of A.D. Smith (2002) *The Problem of Perception*, Cambridge, MA: Harvard University Press for a version of the argument from hallucination that takes off from the premise that ‘for any veridical perception, it is possible that there should be a hallucination with exactly the same subjective character’ (p. 194).

²⁴ Here is a formalization of 1 and 2 under which it is clear that 3a follows from them: $\exists x\exists y(Fx \& Sx \& Fy \& Sy \& x \neq y)$; $\sim \exists x\exists y(Px \& Py \& x \neq y)$; therefore, $\exists z(Fz \& Sz \& \sim Pz)$. As the formalization shows, I take ‘seeing an F’ to imply $\exists xFx$, but not necessarily to imply $\exists x(Fx \& x \text{ exists in the perceiver’s environment})$.

²⁵ For a brief overview of New Realism with references to its proponents, see the introduction to R.M. Chisholm (ed.) *Realism and the Background of Phenomenology* (New York: Free Press, 1960), pp. 28–30.

²⁶ In what sense is the second fingery expanse an external object? Well, the New Realists could say that it has the two marks of externality put forth in G.E. Moore [1939] (1962) ‘Proof of an External World’, *Proceedings of the British Academy*, Volume 25, reprinted in *Philosophical Papers*, New York: Collier Books, pp. 126–48: it has location and extension in space, and it exists independent of being perceived. Perception is a process of selection rather than generation.

²⁷ See James Van Cleve (2002) ‘Thomas Reid’s Geometry of Visibles’, *The Philosophical Review*, Volume 111, pp. 373–416.

²⁸ Cf. Smith, *The Problem of Perception* (cited in note 23), p. 234.

²⁹ This interpretation must explain away several passages in which Reid says that the object of perception always exists.

³⁰ If you are worried about the fingers that are curled into your fist, let it be a pencil that you hold before you. We can stipulate that there are no other pencils in the room.

³¹ A *locus classicus* for the adverbial analysis of sensation is Roderick M. Chisholm (1957) *Perceiving*, Ithaca: Cornell University Press, pp. 115–25.

³² For a characterization and defense of intentionalism along with references to other proponents of it, see Alex Byrne (2001) ‘Intentionalism Defended’, *The Philosophical Review*, Volume 110, 199–240.

³³ See Michael Huemer (2001) *Skepticism and the Veil of Perception*, Latham MD: Rowman and Littlefield, which offers a reply to the argument from double vision. In his reply Huemer assimilates double vision to illusion, denies the first premise in the argument as I have presented it here, and adopts an intentionalist theory of appearing (Huemer 2001: 130–31). He observes that the intentionalist should not assign to double vision the impossible content ‘there is a single finger that is both here and there’ (Huemer 2001: n. 8, p. 146). However, it is not quite clear to me what intentional content Huemer would assign to it.

³⁴ For helpful discussion of the material in this paper, I wish to thank Brian Glenney, Gideon Yaffe, and participants in a workshop on Reid’s philosophy of mind at the Royal Institute of Technology in Stockholm and in a philosophy colloquium at the University of Colorado.