

Do Things Look Flat?

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Abstract

Does a penny viewed at an angle in some sense look elliptical, as though projected on a two-dimensional surface? Many philosophers have said such things, from Malebranche (1674/1997) and Hume (1739/1978), through early 20th-century sense-data theorists, to Tye (2000) and Noe (2004). I confess that it doesn't seem this way to me, though I'm somewhat baffled by the phenomenology and pessimistic about our ability to resolve the dispute. I raise geometrical complaints against the view and conjecture that views of this sort draw some of their appeal from over-analogizing visual experience to painting or photography. Theorists writing in contexts where vision is typically analogized to less-projective media – wax signet impressions in ancient Greece, stereoscopy in introspective psychology circa 1900 – are substantially less likely to attribute such projective distortions to visual appearances.

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Plus one figure

Do Things Look Flat?

i.

I've put a penny on my desk, and I'm viewing it at an angle. Does it look circular? Or, instead, do I only know or judge that the penny is circular, while the figure it presents to my sight – its actual visual appearance – is an ellipse? I gaze out my window and see a row of streetlights. Does it look like they shrink as they recede into the distance? Or do they all look the same size? Get out a penny, open the blinds, try it yourself. (I'll wait.) What do you think?

Alva Noë (2004) and Sean Kelly (this issue) join a long line of philosophers (stretching at least from Malebranche 1674/1997 [§1.7] through Tye 2000) in saying that there's a sense in which the penny looks elliptical and the distant streetlights look smaller and a sense in which they don't. According to Alva, we experience the penny's circularity in its elliptical apparent shape: Part of experiencing the penny as looking circular, given its angle relative to us, is simultaneously experiencing its elliptical visual appearance (p. 166-167). In contrast, Sean says that we normally see the penny simply as circular; only by exception do we experience its "apparent shape", its ellipticity. We don't experience both the circle and ellipse simultaneously, Sean suggests, but we can flip between the two much as we flip sequentially between seeing an ambiguous figure one way and seeing it another.

Now which of them is right? Or is neither right? What do I visually experience as I look at this penny? That seems like substantive, interesting question – a question, furthermore, of the sort that many philosophers have thought we have excellent, perhaps infallible epistemic resources to answer – a question, that is, about the intrinsic properties

of one's own ongoing conscious experience. Am I alone in finding such questions baffling?

For what it's worth, as I stare at the penny now, I'm inclined to say that it looks just plain circular, in a three-dimensional space – not elliptical at all, in any sense or by any effort I can muster, contra both Alva and Sean. I can't manage any Gestalt switch; I discern no elliptical "apparent shape".

ii.

Now I don't wish to be dogmatic about that last point. I feel uncertain in my own introspections. The streetlights in the distance do, maybe, look smaller, in a way. When I tilt the coin far enough, I start to feel the pull of the idea that it presents an elliptical appearance. Can I say these things consistently with denying the coin's elliptical appearance at a 45° angle? Rotating the coin back from 80° to 45°, does the impulse to say it appears in some sense elliptical at some point evaporate?

I confess I'm perplexed. Perhaps my phenomenology is disorganized, or not organized in a geometrically simple way? Or perhaps my terms and concepts are muddled? What is it for something to "look elliptical"? Is the dispute, perhaps, entirely linguistic, or purely theoretical, while the phenomenology itself, considered on its own, is absolutely obvious?

Or am I simply a poor introspector? Maybe the fact that my own phenomenology in this case doesn't seem obvious to me reveals introspective ineptitude on my part. I mean that remark not at all ironically or disingenuously. And yet I'm not sure I should

trust Alva's or Sean's introspections either – even where they agree, and even despite the broad consensus in contemporary philosophy about the elliptical “apparent shape” of the coin. Nor am I as hopeful as Sean is that experimentation will yield cleanly interpretable results in matters of this sort.

I wish I could find my way through this morass. I can't. So I aim to drag you down into it with me.

iii.

There are several ways to transform a circle into an ellipse, but the most natural in this context seems to be to project it obliquely onto a two-dimensional plane – presumably a plane perpendicular to the line of sight. Let's suppose that's how the geometrical transformation is supposed to proceed in the case of the coin: The coin “looks elliptical” or has an “elliptical apparent shape” because projecting it along the line of sight onto a plane perpendicular to that line produces an elliptical figure. Plausible enough?

It's tempting, then, to generalize: The apparent shape of any normal object is determined by its two-dimensional projection onto a plane perpendicular to the line of sight. Alva and Sean (and the general corps of like-minded philosophers) might naturally be interpreted as accepting something like this; at least they don't explicitly ward against such an interpretation. But problems loom.

First, it would seem to follow that my hat, viewed from the top, also appears elliptical, that the orange in front of me appears circular, that the obliquely viewed book on my desk appears (roughly) hexagonal – and, in short, that everything looks or appears

(in the relevant sense of “looks” or “appears”) two-dimensional, flat. Do we really want to be committed to this? The peculiarity of this view can be missed when the object in question, like a penny, is already something approximately flat.

It’s not clear to me whether Alva or Sean would accept the view that everything, in some sense, appears flat; but if not, it isn’t evident exactly where to put on the brakes. Can something’s apparent shape be defined by its two-dimensional projection without its presenting any sort of flat appearance? Well maybe; but that seems rather an uncomfortable sort of view.

Planar projection also invites the question of how to account for the streetlights smalling off into the distance. We can render the farther ones smaller on the plane by projecting along lines that converge at the eye – no problem there; that seems natural enough. But a peculiar result follows from the fact that lines coming from the side will intersect the plane obliquely: the planar projections of objects off the central line of sight will be considerably larger than their straight-ahead counterparts – weirdly larger, if projective size is supposed to be isomorphic to apparent size (see fig. 1).

Insert fig. 1 about here

A natural way to avoid this result would be to project objects not onto a plane but rather onto a sphere centered at the eye. (This would also capture the idea that apparent size varies with visual angle subtended.) But now we’ve lost our ellipse. The projection of a circular region onto a spherical surface isn’t elliptical: The ellipse is a planar figure. The resulting projection is a concave ellipse-like figure (or convex, if the projection

passes through the interior of the sphere). Is this, then, the coin's real apparent shape, to speak most accurately? Does the world look concave? I can almost (but only almost) warm up to the idea – it seems, actually, better to me than saying the world looks flat.

iv.

Is it just obvious and undeniable that the coin appears or looks (in some sense) elliptical, in a way that no geometrical cavils can touch? It's not obvious to me. But of course that's just confessional, just me, and maybe I'm being obtuse or willfully blind. Quite possibly so!

However, I'll tell you what I suspect. I suspect that our inclination to regard the apparent shape of the coin as an ellipse and the farther lightposts as smaller – our inclination to attribute to visual appearances or visual experience what I'll henceforth call projective distortions – is due to over-analogizing visual experience to flat media such as paintings or snapshots. Alva himself thinks theorists have often over-analogized visual experience to snapshots, mistakenly attributing to visual experience photographically rich detail from the center far into the periphery. What I'm suggesting is that Alva (and to a lesser extent Sean and many others) over-analogizes to pictures in a different way, taking visual experience or “apparent shape” to be, in some sense, flat like a picture: The coin “looks” elliptical because that's how we'd paint it.

We over-analogize the mind quite often, I suspect, casting what's difficult and recondite in terms of better-known outward media and technologies, then misattributing features of those technologies to the mind. If you're a Searle fan or a connectionist, you

might think we did that in the 1980s, analogizing thought to classical computation. (Earlier philosophers analogized thought to clockwork or hydraulics.) My favorite example of over-analogizing, though, is the over-analogizing of dreams to movies. This went so far that in the 1950s the overwhelming majority of North Americans said they dreamed in black and white! (Now we say we dream in color. I'm not sure that's true either. See Schwitzgebel 2002; Schwitzgebel, Huang, and Zhou forthcoming.)

v.

I'm not sure how to establish what I've just suggested. Maybe it can't be established. But here's a conjecture which, if true, may support the idea: Theorists writing in contexts where vision isn't typically analogized to two-dimensional, projective media will be substantially less likely to attribute projective distortions to visual experience than those analogizing vision to painting or photography. Two historical periods are especially relevant to this hypothesis: ancient Greece, where the dominant analogy for visual perception was impressing a signet upon wax, and introspective psychology circa 1900, where the dominant analogy (for binocular vision) was the stereoscope.

If a signet is correctly applied, the impression in the wax will accurately match, in complement, the entire shape of the signet, with a correspondence part-for-part that doesn't vary with the circumstances of application. Unlike photographs or paintings, wax impressions don't reflect different parts of their subject, or take on a different arrangement of shapes, contingently upon perspective (though, of course, we may see a wax impression from different perspectives, or a signet may be engraved, incidentally,

with a perspectively represented scene). Now perhaps this absence of perspective is a weakness in the wax-signet analogy: Clearly, in some sense, perception – vision especially – is perspectival. Furthermore, vision is perspectival in a way resembling painting and photography in at least the following respect: A picture will portray (and omit) almost exactly the same parts of its subject a viewer would see (and not see) from that side. In this respect, at least, the picture analogy is superior to the wax-signet analogy for vision. But of course it doesn't follow from this alone that the apparent shapes of things involve projective distortions.

Aristotle and Plato famously employ the signet analogy for perception and memory in De Anima (424a; 435a; see also De Memoria 450a where Aristotle employs both the signet and the picture analogy) and the Theaetetus (esp. 191c-194d), respectively. And indeed in these works, and in related works I have reviewed, neither ever attributes projective distortions to visual appearances, though they do discuss various puzzles about perception, and Plato provides other examples of variation in sensory appearance and judgment. Epicurus embraces the signet analogy (see Letter to Herodotus 49 [note the word εναποσφραγίσαιτο] and Plutarch's Brutus) and positively asserts that our impressions are the same shape as the objects perceived – that is, apparently, not projective distortions.

Sextus Empiricus, though critical of the signet analogy in some places (e.g., Against the Logicians I.228, 250-251, 372, II.400; Outlines of Skepticism II.70), appears to employ it uncritically in others (AL I.293; OS I.49) and never to my knowledge analogizes perception to having a picture in the mind. He's a particularly interesting case because he repeatedly emphasizes variation and distortion in sensory appearances,

offering extensive catalogues at, e.g., OS I.44-52, 100-127; AL I.192-209, 414. For example, he notes that things look different after one has stared at the sun, or when one presses the side of one's eye; that mirrors can change the appearance of things; that oars look bent in water, straight in the air; that what appears in motion or at rest depends on whether one is on the ship or the shore; and so on. Sextus's skeptical arguments require that he stress how sensory appearances vary with differences in situation; it's one of his most famous and central points. And yet I find no mention of the kinds of cases that dominate later discussions of projective distortion, such as the coin viewed obliquely or the receding row of columns – or, indeed, any unambiguous mention of two-dimensional projective distortions of any type whatsoever.¹ It's difficult to imagine that he would have left phenomena of this sort off his lists of perspectival variation, had they occurred to him.

I'm no classical scholar, but in the ancient Greek literature I've managed to review thus far, I've found few explicit comparisons of visual perception, or even visual imagery, to pictures or paintings. And I've found no clear case of any ancient Greek philosopher

¹ Sextus does say that from a distance a square tower may look round or a large thing small (OS I.118; AL I.208, 414), but I read these as cases of genuine misperception rather than projective distortion. He also mentions that a column viewed from one end appears to taper but not when viewed from the middle (OS I.118). I'm inclined to read this as pertaining to illusion in the perception of columns, a topic much discussed in ancient Greece, and not as involving projective distortion in the sense discussed here. A genuine projectivist would say, of course, that columns appear to taper at both ends when viewed from the middle.

attributing projective distortions to visual appearances. One does begin to see projective distortion, however, and perhaps a decline of the wax analogy, with even as small a cultural shift as to ancient Rome (Lucretius De Rerum Natura IV, circa l. 430) and Egypt (Euclid's and Ptolemy's optics; Plotinus Ennead II.8, IV.6.1).²

(Translations of ancient Greek classics do often employ the word “picture” in discussions of visual imagery – that is, not visual sensations, but visual imaginings. As far as I can tell, however, from the cases I've examined, it is generally the translator bringing in the analogy; the original Greek texts do not explicitly suggest it. Such interpretations may arise because calling images “pictures” almost doesn't seem metaphorical to us. We're even more prone to compare visual imagery to flat media than visual sensation. I wonder why this is. Are images actually flat? Or does their seeming insubstantiality discourage comparison to more robust media regardless of their two-dimensionality or lack of it?)

vi.

Stereoscopes, which enjoyed a vogue in late 19th century parlors, served as the preferred analogy for binocular vision among some of the early introspective psychologists (e.g.,

² The term “impression”, which seems derived from the signet metaphor, continued, of course, to have a prominence in philosophy into the modern period – but I suspect that the metaphorical force, the power of the suggestion of impressed wax, declines in those later uses. Likewise for contemporary psychological use of “stereoscopic” in reference to binocular vision.

Helmholtz 1867/1925; Mach 1886/1959; Wundt 1897/1897; Titchener 1901-1905, 1910).

A stereoscope holds two photographs, taken from slightly different perspectives, and presents one to each eye. If the perceiver succeeds in “fusing” the two pictures, she experiences a lively three-dimensional effect. Although stereoscopes are perspectival as signet impressions are not, the stereoscopic image is not a simple two-dimensional projection.

In accord with my conjecture, I’ve generally found that psychologists favoring stereoscopy as an analogy for sight also tend to avoid saying (except in cases of outright illusion) that “apparent size” varies with distance or that the circle viewed obliquely “looks” elliptical – though Helmholtz is a notable exception. Conversely, authors not as swept up in stereoscopy (e.g., Dewey 1886), or who seems generally to prefer the picture analogy (e.g., James 1890/1981), more frequently attribute projective distortions to experience.

Psychologists analogizing vision to stereoscopy tend to stress the difference between monocular and binocular vision. Mach, for example, in presenting the sketch reproduced in Noë (2004, p. 36), emphasizes that a flat picture can only adequately represent monocular vision; “stereoscopic” vision, he says, can’t be represented by a single plane drawing (1886/1959, p. 18). Would he, then, have been willing to say that a circle viewed at an angle looks like an ellipse monocularly but not binocularly? To contemporary sensibilities this may seem strange: It seems – to me at least – that monocular vision just isn’t that different from binocular vision (though see O’Shaughnessy 2003). Binocular disparity (as late 19th-century psychologists well knew) is only one among many depth cues. The world doesn’t go flat and then puff out as I

open and close one eye, I think. But of course in stereoscopy, the difference between monocular and binocular views is essential.

Psychologists fond of the stereoscope analogy also seem readier than others to find doubling in visual experience, like the doubling, perhaps, of an unfused image in a stereoscope. Titchener writes, for example:

[T]he field of vision ... shows a good deal of doubling: the tip of the cigar in your mouth splits into two, the edge of the open door wavers into two, the ropes of the swing, the telegraph pole, the stem of another, nearer tree, all are doubled. So long, that is, as the eyes are at rest, only certain objects in the field are seen single; the rest are seen double (1910, p. 309).

That most people fail to notice this, Titchener remarks, is “one of the curiosities of binocular vision”.³

vii.

Hume writes:

‘Tis commonly allowed by philosophers, that all bodies, which discover themselves to the eye, appear as if painted on a plain surface (1739/1978, p. 56).

And G.E. Moore says, after holding up an envelope:

³ However, such remarks aren’t limited to stereoscope enthusiasts: e.g., Reid 1764/1997 §VI.13.

Those of you on that side of room will have seen a rhomboidal figure, while those in front of me will have seen a figure more nearly rectangular (1953, p. 33).

I suppose it isn't as obvious to me as it has been to many others that there is any sense in which these remarks are true. But I'm not sure how to go about resolving this question. Staring longer at the penny leaves me only more perplexed.⁴

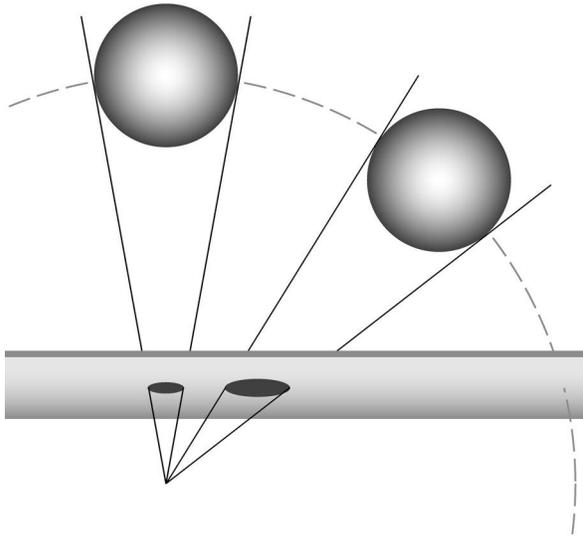
⁴ Thanks to David Barlia, Richard Betts, John Dilworth, Pauline Price, Teed Rockwell, John Schwenkler, Charles Siewert, and Gideon Yaffe for useful discussion. Thanks to Glenn Vogel for designing the figure. For more reflections in a similar vein see Schwitzgebel (in preparation). My understanding of Sean's view is based on his presentation at the 2005 Pacific APA meeting and on a draft of his commentary he kindly provided in July 2005. My apologies to Alva for getting so carried away by one aspect of his book that no room remains to discuss any of the many other interesting issues it broaches.

- Dewey, John (1886). Psychology. New York: Harper.
- Helmholtz, Hermann (1867/1925). Treatise on physiological optics. Ed. J.P.C. Southall.
New York: Dover.
- Hume, David (1739/1978). A treatise of human nature. Ed. L.A. Selby-Bigge & P.H.
Nidditch. Oxford: Oxford.
- James, William (1890/1981). Principles of psychology. Cambridge, MA: Harvard.
- Mach, Ernst (1886/1959). The analysis of sensations. Trans. C.M. Williams. New
York: Dover.
- Malebranche, Nicolas (1674/1997). The search after truth. Trans. T.M. Lennon.
Cambridge: Cambridge.
- Moore, George Edward (1953). Some main problems of philosophy. London: George
Allen & Unwin.
- Noë, Alva (2004). Action in perception. Cambridge, MA: MIT.
- O'Shaughnessy, Brian (2003). Consciousness and the world, new ed. Oxford: Oxford.
- Reid, Thomas (1764/1997). An inquiry into the human mind. Ed. D.R. Brookes.
University Park, PA: Pennsylvania State.
- Schwitzgebel, Eric (2002). Why did we think we dreamed in black and white? Studies
in History and Philosophy of Science 33, 649-660.
- Schwitzgebel, Eric (in preparation). The unreliability of naive introspection.
- Schwitzgebel, Eric, Huang, C., and Zhou, Y. (forthcoming). Do we dream in color?
Cultural variations and skepticism. Dreaming.
- Titchener, E.B. (1901-1905). Experimental psychology. New York: Macmillan.
- Titchener, E.B. (1910). A text-book of psychology. New York: Macmillan.

Tye, Michael (2000). Color, consciousness, and content. Cambridge, MA: MIT.

Wundt, Wilhelm (1897/1897). Outlines of psychology. Trans. C.H. Judd. New York:
Stechert.

Figure 1



[See accompanying JPEG file for a larger version of this figure.]