TWO FIELDS OF VISION

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Our eye-beams twisted and did thread. . . .

—John Donne (“The Ecstasy”)

When Robert Fogelin lectures on phenomenalism, he asks students to point at the sun. After they point, he reminds them that sunlight takes eight minutes to reach the earth. Fogelin asks if they wish to point again. Many now point a bit ahead of the sun’s apparent position.

Fogelin conducts this exercise to illustrate the possibility of public sense data—as when G. E. Moore speculates that surfaces might be sense data. My interest is perceptual demonstratives. I modify Fogelin’s exercise to reach the conclusion that there are two visual fields.

One of these fields guided the Greeks in the development of the extromissive theory of vision (in which a visual ray extends from the observer’s eye to the seen object). Although the extromissive theory of vision has long been refuted, there is surprisingly robust evidence that many people continue to believe in eye-beams (Winer and Cottrell, 2004).

Even when eye-beams are explicitly acknowledged as mythical, the extromissive theory of vision survives as an organizing fiction. In computer graphics, ray-casting algorithms shoot rays from the eye to the closest opaque objects. Ray tracing algorithms extend the ray to accommodate reflection, refraction and shadows (Godse 2009). Most of the photons emanating from objects fail to reach the eye, so a more realistic approach would involve wasteful computation of visually insignificant light paths.

The human visual system has a parallel aversion to clutter. Ditto for narration of what is seen. Extromissive principles may structure perceptual demonstratives just as geographical fictions structure spatial talk.
Ralph Waldo Emerson claims, “The eyes of men converse as much as their tongues, with the advantage that the ocular dialect needs no dictionary, but is understood all the world over.” (1914, 117–118) He also says, “The glance is natural magic.”

Where does the magic come from? One plausible source is the “Eye-Direction Detector” module of the visual system (Baron-Cohen 1995, ch. 7). To figure out what a viewer is looking at, it is more efficient to project from a single pair of eyes to a possible target than to project from many possible targets to the single pair of eyes. The effort of casting our glance from the viewer’s eyes to possible targets makes it seem as their eyes are projecting something outward (thereby reversing the actual direction of causation). Complementing this illusion is the opposite experience of being spotted looking at someone. Detection is experienced as an incoming projectile that can only be avoided with a quick duck.

The other field of vision inspired the intromissive theory (in which the rays run in the opposite direction from object to observer). When distinguishing between the apparent location of an object and its real location, we make a double-use of a single demonstrative gesture. By means of this visual pun, we truthfully utter paradoxical sentences such as ‘That is not there’ and ‘This is not here’.

These sentences may owe some of their aura of inconsistency to their infrequency. In the familiar common sense settings favored by ordinary language philosophy, things are where they appear to be. Even if there is a discrepancy, it passes without notice. However, ‘That is not there’ has a pocket of currency among observers who go out of their way to distinguish apparent locations from real locations. Accordingly, most of my examples involve extraordinary spectacles or ordinary things viewed from extraordinary perspectives. Scientists take both types of observations seriously. Therefore, a theory of perceptual demonstratives must accommodate them.

The general lesson I draw from ‘That is not there’ and ‘This is not here’ is dualism; there are two qualitatively different fields of view. The intromissive field is earthily causal; this realm is rooted in the body and circumscribed by the subtle physics of light. The extromissive field is ethereally mathematical. This ideal realm concerns what the observer ought to see. Since the idealization predates science, it is grandfathered out of the laws of physiology and physics.

In his Optics Euclid regimented rules structuring the extromissive field of vision. Although Euclid mistakenly imputed physical reality to extromissive rays, the observer can apply these rays to the scene before him in the way a surveyor applies geometry to the landscape.

Like Rene Descartes’ mind-body dualism, my physical-mathematical dualism is anthropocentric. Although other species have eye direction detectors, homo sapiens is the sole species that has access to the extromissive field of vision. Unlike the individualist Descartes, I trace this uniqueness to our social
nature. Human beings team up to exploit a niche for generalists (for almost all of our evolutionary history, as hunter-gatherers). The behavioral signature of this collective tropism is declarative pointing. Whereas a chimpanzee may point to get a banana, a child will direct attention to an object for which it lacks a desire (such as a cloud).

To ascertain what the speaker is looking at, the audience relies on heuristics. People generally see what is in front of them, what is not too close nor too far, what is big and moving, rather than what is small and stationary. Some of these heuristics, especially those governing lines of sight, have fossilized into conventions. These conventions can be superseded by gestures such as finger pointing. The idea is to streamline communication by standardizing the observer. The simplifications enable the group to rapidly lock on to the same target. Since the overriding concern is timely coordination, much visual fiction is tolerated. People can point to things that everybody realizes they cannot see.

Like Descartes’, my dualism is interactionist; a sentence governed by a single demonstrative gesture can involve both fields of view. ‘That is not there’ can be true because the demonstration is used intromissively to secure a referent for ‘that’ and extromissively to secure a referent for ‘there’. Thanks to the visual pun, ‘That is not there’ avoids contradiction and ‘That is there’ avoids tautologous triviality.

Moore’s Partial Tautologies

In his *Commonplace Book* G. E. Moore writes: “Let us say ‘this thing’ = ‘the thing that is here’, and ‘that thing’ = ‘the thing that is there’” (1962, 158). According to Moore’s equation, ‘That is there’ is “part tautology”. The redundancy of the sentence ensures that it is true whenever asserted. Yet the demonstratum only contingently exists at that location.

Moore rejects the paraphrase ‘that thing’ = ‘the thing at which I am pointing’ because the proposition is not understood until the thing is seen. Moore infers that we identify places by their occupants rather than identifying occupants by their places. But whichever the direction of primacy, ‘That is not there’ should never be true.

Suppose a student takes Professor Fogelin’s caveat to heart. She points to the sun and announces ‘That is not there!’ According to Moore’s equation, her ‘there’ should refer to the location of the referent of her ‘that’. A single demonstration governs the sentence so the time lag should be irrelevant; there should shadow that.

*There* strays from that when the speaker wishes to distinguish true positions from apparent positions. Consider a spear fisherman teaching a novice. He corrects the novice’s aim by noting that the image of the salmon is refracted. The fisherman can point to the salmon and warn ‘That is not there’.
In 1971, the conceptual artist Yoko Ono held an exhibit at the Everson Gallery in Syracuse entitled “This is not here”. The invitations were printed on folded, partially fixed photographic paper. Once unfolded and exposed to light, the image faded. The recipient was left with a faint after-image of the contents (plus Yoko Ono’s name and phone number on the reverse side). The experience was designed to elicit wonderment at the transitory nature of all things, even the photographs used to preserve ephemera.

G. E. Moore would object that Yoko Ono has only challenged ‘This is always here’. Given Moore’s equation, ‘this thing’ = ‘the thing that is here’, so ‘This is not here’ is never true.

Genuine counterexamples to Moore’s equation can be constructed from navigational disorders. For instance, after people adapt to universal refraction they become temporarily ill adapted to normal viewing conditions. Hermann von Helmholtz (1867/1925) wore spectacles containing prisms that shifted the image eleven degrees. The displacement is so small that things look fine when you look through the spectacles. You notice trouble only when you try to grasp objects. You miss by eleven degrees. With practice, your aim improves. You adapt perfectly to the refraction. When you remove the spectacles, you make errors in the opposite direction. Even though your environment is normal, you are eleven degrees off. If you close your eyes and point to a button in accordance with your visual memory, you can truthfully say ‘This is not here’. (You need to cover your eyes to prevent the feedback you receive from watching your hand.)

There is a strong default assumption that whatever you see is outside your eye. It is hard to see anything as being located inside your eyeball. Consider floaters, the clumps of dead cells in the eyeball that are visible as silhouettes. Naïve people clutch for floaters as if they were gnats. A veteran sufferer, knowledgeable of the floater’s true location, can mentally single out a floater and patiently say ‘That is not out there; it is in here—inside my eyeball’.

With practice, the veteran can learn to see other “entopic phenomena” as being inside his eyeball. For instance, if he wiggles a penlight at the side of his eye in a dark room, he can see the blood vessels that sprawl across his retina—and see them as being inside his eyeball. This sophistication makes him vulnerable to the reverse error of mistaking external phenomena as entopic phenomena. Consider a sophisticated veteran who has heard about the Loa Loa, a parasitic eye worm indigenous to West Africa. While in a tent in equatorial Sudan, he awakes to the sight of a worm. He is paralyzed with the fear that the worm is inside his eyeball. He calms himself with the hopeful hypothesis that the worm is on the ceiling of the tent: “This is not here; it is out there.”

The potential for mislocation increases with distance. So there is a wider array of puzzle cases for ‘That is not there’ than ‘This is not here’. For the sake of convenience, I shall concentrate on puzzle cases for ‘That is not there’.
We most readily report mislocations along the vertical axis or the horizontal axis.

But some mislocations are restricted to depth. Aristotle concedes that the huge harvest moon appears closer to the earth. After arguing that this is an illusion, Aristotle may have pointed to the harvest moon and concluded ‘That is not there; it is as far away as it normally is’.

Time is also subject to physiological distortion. Given the limited speed of biochemical reactions, we see things as they were, not as they are. So in addition to the objective lag between the time the sun emits light and the time the light reaches our eyes, there is a subjective lag. There is an interlude between when the retina is stimulated and when the brain forms the image of the sun. When viewing a very fast object, such as a meteorite, the object’s apparent position lags behind its actual position.

At 95% the speed of light, there is a breakdown of the principle that we see only the facing side of a front-lit object (Sorensen 2011). At this speed, a sphere undergoes Lorentz contraction into an ellipsoid. Yet this flattening will not be apparent to an observer because the light from the trailing part of the sphere will reach the observer from behind the sphere. Thus the distorted sphere continues to look perfectly round. The field of vision, as defined by Euclid, incorrectly excludes the possibility of seeing the backsides of objects.

Distortion is ubiquitous in astronomy. Students align their telescopes with the geometrical information furnished by star charts. Their teachers warn that, to have the stars appear in their telescopes, the students must compensate for refraction. The atmosphere operates as a big lens. With the exception of a heavenly body directly overhead, everything is displaced, especially toward the horizon.

Refraction distorts the location of the sun much more than the speed of light. The distortion due to light’s limited speed is only a hundredth of the apparent diameter of the sun. Therefore, if you can discern a finger movement by one of Fogelin’s students, you know the student over-compensated. If it is a morning class, then refraction will swamp the time lag distortion. Since refraction pulls the image up toward the azimuth, the true position of the sun will be lower than it appears, not higher. A student who hopes to indicate the true location of the sun must very slightly lower his finger, not raise it.

There are conditions under which the objective time lag and the refraction exactly cancel out. As the apparent position converges with the geometric position, a knowledgeable astronomer could point at the sun and triumphantly say ‘That is there!’.

‘There’ can pick out representations of location. Consider trompe l’oeil confusions of space with picture space. The fly painted by Carlo Crivelli in “Saint Catherine of Alexandria” tempts viewers to wave it away. After the fly fails to respond, the viewer may exclaim ‘That is not there!’. My thesis that there are two visual fields for real space—the space to which we
egocentrically orient. (Pictorial space only allows us to navigate with the help of a “You are here” indicator.)

A Comparison with the Answering Machine Paradox

Pioneers in the study of indexicals deduced that ‘I am not here now’ necessarily expresses a falsehood (even though the falsehood expressed is contingent). After all, if ‘I’ denotes the utterer while ‘here’ and ‘now’ denotes its place and time, then each utterance of ‘I am here now’ must be true. Robert Stalnaker, David Lewis, and David Kaplan agreed that an adequate theory of indexicals must accommodate this result (Sidelle 1991, 525).

This nice theorem is challenged by the answering machine. A recorded message can truthfully begin ‘I am not here now’.

Pioneers in the study of demonstratives face a parallel challenge. Their nice theorem is that an assertion of ‘That is there’ when governed by a single demonstration always expresses a truth.

The counterexamples under discussion have actually been to a corollary: that an assertion of ‘That is not there’, when governed by a single demonstration, never expresses a truth. (Some of the pioneers permit ‘That is not there’ to be meaningless rather than false—especially when there is no demonstratum.)

Moore argued ‘That is there’ is a partial tautology because ‘there’ inherits its reference from ‘that’. This direction of primacy can be buttressed by the relativist’s doctrine that space is an abstraction from objects. It is easy to concentrate on the place a pill is at by looking at the pill. In contrast, “Try to concentrate upon a pill-sized region on a white wall in front of you: even if you keep looking, do you have any confidence, at the end of fifteen seconds, that you are still looking at the same region you began with?” (Evans 1982, 172).

If each position must be anchored to perceived object, then one ought not to be able to discern positions in empty space. But consider an astronaut viewing a sparsely populated region. The objects disappear one by one until none remain. He is now seeing empty space. Moreover he can recall where the objects were (at least roughly) and can direct his attention to regions where he predicts new objects will appear.

The possibility of an empty field of vision shows that we cannot identify the field of vision with the sum of viewed objects (Richardson 2009). This identification is independently defective because it fails to reflect order effects. Distinct scenes can be composed from the same objects. Moreover, the visual scene is rarely a plenum; commonly there are empty spaces between objects and in objects. We see these gaps and holes. Shifting the position of objects within a visual field can alter what is occluded. This leads Michael Martin to identify the field of vision with all visible locations (places where
an object could be seen by the subject). This includes regions of space actually occluded by objects (Martin 1992, 199) or hidden in darkness (1993, 214). What is excluded is the region outside our sensory range. Although we do not see the boundaries of our visual field, we are aware of them. Martin chiefly has in mind the boundaries of our peripheral vision. But we ought to also include the vanishing point as a further limit—despite its central location in the visual field (Sorensen 2007, 435).

To accommodate the possibility of seeing empty space, the causal theorist might accept causation by absences. The geometrical theorist might regard a non-terminating visual ray as a successful representation of a portion of space rather than as a failed representation. The visual ray would be akin to a blind man feeling a hole with his cane.

The reverse of Moore’s hypothesis says ‘that’ inherits whatever object occupies the place designated by ‘there’. The formal elegance of coordinate systems moved Michael Bennett to propose that only places be demonstrata (Kaplan 1989, 527–8).

Can we put some meat on Bennett’s bones? Yes. According to Immanuel Kant, there is an *apriori* framework of space and time which dominates our conceptual scheme. If you attend to one place and then another place to its right, then you know *apriori* that ‘This place is to the right of that place’. It is pre-empirical. To get empirical knowledge going, you must form an idea of objective objects. That presupposes space. The subject identifies objects in accordance with the *apriori* coordinates of egocentric space.

Peter Strawson develops Kant’s themes in Individuals. Strawson’s elaborations are in turn refined by his student Gareth Evans. Evans (1982, ch. 4) traces the connection between objects and their places to Bertrand Russell’s principle of acquaintance. Russell’s principle says that you cannot make a judgment about something unless you know which object this judgment is about. Knowing which object you are judging is a matter of being able to discriminate it from all other objects of the same sort. Descriptions help but they cannot be full story because duplicate objects fit the same descriptions. According to Evans, the fundamental ground of the difference between objects is their positions in space and time. Two objects of the same sort cannot be in the same place at the same time. So to make a judgment about an object you must be able to figure out where it is. Perception gives you this fundamental knowledge. After seeing an object you can track it through space and time, re-identifying it as the same object that you originally saw. Of course, you might not actually know where the object is now. The object might be blocked from view or camouflaged. But you must be able to locate it in principle.

Recall the novice spear fisherman. Prior to instruction, he is ignorant of refraction and so mislocates the salmon. The novice does not satisfy Evans’ requirement that the subject know which object his judgment is about. The
sheer existence of an information link between the subject and object is not enough (Evans 1982, 145–51). According to Evans, the novice would merely be under the illusion of having demonstrative thoughts about the fish. That is implausible.

As in the answering machine paradox, promising theories of direct reference elegantly predict that ‘That is not there’ is “part contradiction”. Despite the plausibility of the prediction, these theorists are discommoded by oxymorons that come out true and assertible.

Indexicals secure reference automatically without the need for pointing or any other kind of demonstration. In contrast, the early David Kaplan says that an overt demonstrative gesture is necessary for a demonstrative term to be meaningful. He illustrated how a demonstration overrides a competing intention with his Spiro Agnew scenario (Kaplan 1978): A lecturer believes there is a portrait of Rudolf Carnap behind him. Without looking, he points to his rear and says ‘That is a portrait of one of the greatest philosophers of the twentieth century’. Unbeknownst to the speaker, a portrait of Spiro Agnew has been substituted for Carnap’s, so the lecturer was pointing at Agnew’s portrait. The lecturer is embarrassed because he referred to Agnew’s portrait as being the portrait of a great philosopher. Thus the demonstration prevails over competing intentions.

Kaplan (1989b, 582) later changed his mind and demoted pointing to the pragmatic role of clarifying the speaker’s “directing intention”. His goal was to assimilate Keith Donnellan’s attributive-referential distinction. Kaplan’s idea is that referential uses of descriptions involve demonstrating with a description. If a description or a gesture is merely used to secure reference, then they succeed even if they are a bit inaccurate. Since the speaker’s mistakes are “off the record”, the utterance can still be true. A speaker can use ‘the man drinking a martini’ to refer to a man who is actually drinking water. A speaker who intends to refer to a woman can succeed even if his finger actually lines up with a moth near her ear.

I share Margaret Reimer’s (1992) doubts about whether Kaplan’s new approach can deal with cases in which the speaker is more than a little off. (In the Spiro Agnew case, the speaker is way off.) But the issue of speaker error is irrelevant to the puzzle cases. The asserters of ‘That is not there’ know what they are talking about. There are no competing intentions. The speakers in the puzzle cases are warding off a mistake that others might commit.

The puzzle cases involve a known contrast between a real location and an apparent location. This contrast can be achieved unparadoxically with nondemonstrative uses of ‘that’ and ‘this’: ‘Liquid methane was expected on the surface of Titan. That is not there.’ In this case, ‘that’ anaphorically refers back to the liquid methane and ‘there’ refers back to the surface of Titan.

Here is a second type of unparadoxical scenario: The head librarian has found the missing copy of Dr. Seuss’ Green Eggs and Ham. When she sees her new assistant searching for it in the cookbook section, the head
librarian disdainfully points to the book and declares ‘That is not there!’. Her finger singles out the book while her glare fixes the location of ‘there’. The librarian’s remark is not puzzling because there is one demonstration for ‘that’ and a diverging demonstration for ‘there’.

**The Reference Failure Proposal**

‘That is not there’ is sometimes used to convey reference failure. Consider a parsimonious philosopher who does not regard afterimages as private mental entities. He regards the afterimage caused by the flash of camera as merely an effect of temporary, localized blindness (Clark 2000, 96). He says ‘That is not there’ to restrain reification of a non-representation into a mental entity. If all the puzzle sentences involve a reference failure, then ‘that’ and ‘there’ do not really separate.

If all the puzzle sentences involve reference failure, then speakers cannot truthfully assert exclusive disjunctions composed of the puzzle sentences. When confronted by a double-image, one may believe exactly one of the representations is veridical: Either that [pointing toward the left image] is not there or that [pointing toward the right image] is not there.

The proposal also conflicts with the principle of charity. If Fogelin’s students fail to refer to the sun, nearly all speakers would fail to refer when they try to point at the moon, the stars, and even nearby objects that are refracted or reflected. The reference failure proposal attributes too much error.

Much of the philosophical interest in demonstratives springs from their undemanding nature. We successfully refer despite ignorance and misconceptions about the demonstratum. The demonstratum does not even need to currently exist. A supernova specialist witnessing a flare up of Eta Carinae can conjecture ‘That is not there’. If the star has already destroyed itself, then the conjecture is true.

If pointing at an object were like hitting a target with an arrow, then there would be many misses and therefore much reference failure. Mercifully, the analogy between pointing and archery confuses cause and effect. When local Indians wished to impress a farmer with their archery, they would use his barn as a practice target while he was gone. When the returning farmer inspected his barn, he found each arrow at the center of a chalk circle. The farmer would marvel at their accuracy.

Actually, the Indians shot the arrows first and then drew circles around the arrows. We deceive ourselves in the way the Indians deceived the farmers. Our amazing demonstrative accuracy is confined to cases in which the demonstratum has already made its mark on us. The mark is the perception caused by that object. This effect is used to refer back to the cause. However, demonstrators are susceptible to a control illusion in which they reverse
cause and effect. Speakers underestimate their passivity, preferring to picture themselves as shooting rather than as being shot.

**Extromission Theory**

Recall the ancient debate about visual rays. Extromission theorists said that the subject sees by virtue of visual rays that extend from eye to object. Intromission theorists said the rays go in the reverse direction from object to eye. As a physical theory, extromission only lingers in cartoon depictions of seeing, such as Superman’s x-ray vision.

One of the mysteries of Superman’s x-ray vision is the stopping problem: Where does the visual ray end? The inventors of Superman, the writer Jerry Siegel and the artist Joe Schuster provide a partial answer when they stipulate that Superman cannot see through lead. But what happens when there is no lead to limit Superman’s vision?

Euclid was an extromission theorist but his solution to the stopping problem is never specified in his geometry of sight. He passes the buck from rays to objects by saying that one sees the first opaque object. This lets Euclid concentrate on the geometrical properties of visual rays. Since Euclid believed visual rays travel straight and instantaneously, his Optics modeled rays as abstract lines. The result is an elegant representation of the subject’s field of vision. In his Caloptics, Euclid rigorously extended the geometry of vision to indirect seeing involving mirrors.

Clearly, Euclid assumes we cannot see through a mirror. However, our pointing can penetrate a mirror. A homeowner can point at the stain on the wall that is concealed by the mirror. This is an interesting case for Colin McGinn’s (1981) proposal that the referent of ‘that $F$’ is the first $F$ to intersect the line projected from the speaker’s finger. McGinn’s use of complex demonstratives answers the question of how far the line extends. You stop at the nearest $F$. However, he does not specify whether mirrors alter the path of reference. If the path bends with the light, then the homeowner’s demonstratum might be a stain on the opposite wall that is reflected by the mirror.

**Intromission Theory**

Michael Devitt (1981, 43) says ‘that’ picks out a cause of that utterance. His causal theory of demonstratives is much more restrictive about pointing through objects. You can point through transparent objects such as a sheet of glass. But you cannot point through opaque objects such as a sheet of lead.
‘Opaque’ needs to be relativized to viewing conditions. In backlit circumstances, where objects are seen by virtue of the light they block, we can see through objects in the shadows of the silhouetted figure. Consider the eclipse riddle depicted in Figure 1 (Sorensen 2008, chapter 1).

![Figure 1. Intersecting Eclipses.](image)

There is a double eclipse involving two heavenly bodies, Near and Far, aligned along the same line of sight with the same apparent diameter. Either heavenly body would suffice to produce the image (which looks like a regular, single eclipse). Does the observer on earth see the near body, Near, or the far body? The causal theory of perception precludes Near as object of sight because it is causally idle. Given that one sees either Near or Far, the causal theory picks Far because it is blocking the light. Devitt’s causal theory of demonstration implies a parallel answer for what the observer is pointing at. When the astronomer says ‘That heavenly body is very black’, the ‘that’ refers to Far. According to McGinn’s extromissive theory, ‘that heavenly body’ refers to Near.

When the astronomer says ‘Look there!’ he is not sure whether he is looking at Far or looking at Near. Thanks to previous measurements, the astronomer knows the locations of both Near and Far. In some sense, he is consciously attending to the location of both heavenly bodies. But he is not referring to both places. He does not know whether he is referring to Near or Far.

Unlike extromission, intromission has physical reality; there really are light signals passing from objects to the eye. These rays travel through space at the speed of light. They obey Snell’s law as they pass through different media. And their paths are further influenced by gravity.

Albert Einstein (1936) speculated that a large object could act as a “gravitational lens” that produces twin images. In 1979, astronomers
discovered a quasar that had two images produced by an intervening galaxy. Since the “true position” of the quasar is behind the galaxy, the astronomers could align with either of the quasar's images and truthfully say ‘That is not there’. If all pointing were intromissive, then the astronomer could have truthfully said ‘That quasar [pointing toward the left image with his left finger] is there [pointing toward the right image with his right finger].’ If our pointing were always extromissive, then the sentence would be an *a priori* falsehood; a quasar cannot be in two places at once!

**Multiple Visual Fields**

The intromissive field of vision often diverges from the extromissive field of vision. In the case of mirages, the lens effects of the atmosphere are so strong that we describe observers as seeing “what is not there”. Those who equivocate between the demonstrative reading of *there* and its existential reading will infer that mirages are hallucinations.

As earth scientists emphasize, mirages are atmospheric phenomena that can be photographed. Hallucinations, in contrast, are due to internal perceptual malfunctions. This creates an asymmetry in how we explain misperceptions. In the case of mirages, we blame the weather. In the case of hallucinations, we blame the observer.

The Captain's log of the exploration ship *Endurance* contains the following entry:

> From the mast-head the mirage is continually giving us false alarms. Everything wears an aspect of unreality. Icebergs hang upside down in the sky; the land appears as layers of silvery or golden cloud. Cloud banks look like land, icebergs masquerade as islands or nunataks, and the distant barrier to the south is thrown into view, although it really is outside our range of vision. (Shackleton 1998, 34)

Talk of seeing things outside one’s range of vision would be contradictory if there were a single visual field. The extromissive field of vision is the idealized construction made familiar by Euclid and by art teachers imparting the principles of perspective. The intromissive visual field is the sloppier, causal imprint on our visual system. Since cameras are tailored to what human beings really see, photographs convey the intromissive field of vision.

The intromissive field of vision is circumscribed by the speed of light. Thus an intromissive demonstrative “travels slower” than an extromissive demonstrative. Think of how Wilhelm Olber presented the paradox of why the sky is dark at night (Harrison 1987). Olber would point at a random dark part of the night sky and say ‘There is a star that no one sees’. Olber picked out a star by virtue of the line of sight he established, not by virtue of the effect that the star had upon him. Since there is a star along any line
of sight, the sky is covered with light sources. So why isn’t the sky bright even when we are not facing the sun? Olber’s demonstration works because extromissive demonstration is faster than the speed of light. Extromissive demonstration expands our referential range beyond our light cone.

Extromissive demonstratives also have terrestrial advantages. Since an extromissive demonstratum does not need to be a cause, the demonstrative can succeed when the demonstratum is blocked from view. My favorite example was launched by a secretary. A student asked her where his teacher’s office was. The secretary escorted him into the hallway to establish a clear line of sight, and then pointed through the ceiling to an office on the floor above them: ‘There it is’.

This barrier penetrating demonstration conforms to McGinn’s extromissive account of demonstratives: the referent of ‘that \(F\)’ is the first \(F\) to intersect the line projected from the speaker’s finger. After all, the first office to intersect the line projected from the secretary’s finger is the teacher’s office. McGinn’s account does not even require that the demonstrated object be the sort of thing that can be seen. (He does not incorporate Euclid’s opacity condition.) You can point at an invisible man. If there are two invisible men in your line of sight, McGinn’s extromissive theory implies you point at the first one. Devitt’s intromissive theory implies you fail to point at either.

I am assuming that McGinn would analyze the demonstrative use of ‘there’ like he analyzes the demonstrative use of ‘that’. True, ‘there \(F\)’ lacks the grammaticality of ‘that \(F\)’ so one might be tempted to deny that ‘there’ could be a complex demonstrative. But the guiding role of sortals is clear from stepping stone demonstrations. When trying to point to an inconspicuous object, the speaker may choose to first point to a more salient demonstratum to narrow the target range. He can also use the relative depths of his pointing finger to indicate the relative distance to the demonstratum. This works even when the demonstratum is invisible. A surgeon points “through” your shirt pocket and says ‘There is your pericardium’. (His ostension succeeds without penetrating your skin.) Driving his finger deeper he says ‘There is your heart’. Driving still deeper the surgeon arrives at his destination ‘And there is your aortic arch’.

The sortals also navigate to absences. The surgeon could go on to say ‘There is the hole in your aortic arch’. Curiously, we can also point to absent absences. A pediatrician can point to a deformed nose and say ‘There is the missing nostril’.

My main thesis is that two demonstrative terms governed by the same demonstration can apply to distinct fields of view. Simultaneous use of two fields of view may seem unworkably schizophrenic. But rival visual fields are normal. The visual field of your left eye only partially overlaps with the visual field of your right eye. Your eye doctor makes this plain when he asks you to point at an object with your left eye closed and then has you switch eyes. Your finger appears to jump out of alignment as you switch.
The eye doctor performs this experiment to learn which eye is dominant. When both eyes are open, the brain unifies the visual field by discarding some of the information coming from the dominated eye. However, some of the discrepancies between the two visual fields are exploited. For instance, the differences present an opportunity to calculate depth by using motion parallax.

We overestimate how unified our field of vision needs to be. As disclosed by studies of the rapid eye movements known as saccades, we get by on a montage of tiny snapshots. There is much “filling in” by our surprisingly interpretive visual system.

The sense of competition between the intromissive and extromissive fields of view also abates when one remembers how idealized the extromissive field is. The captain of the Endurance really was seeing objects outside his geometrical “range of vision”. (So do we; at sunrise and sunset the sun is below the horizon.) Some of the things inside the captain’s geometrical range, such as sheets of clear ice lying on the snow, could not be seen because they could not have an appropriate causal impact on his visual experience. The geometrical field of vision overstates and understates what is really visible.

Reflection proliferates visual fields. When wall-size mirrors were introduced to expand the apparent size of restaurants, some patrons were taken in by the illusion. Asked which table they wished to be seated at, patrons pointed at tables that appeared to be far in front of them. By responding ‘That is not there’, the waiter was ruling out a place in the virtual space beyond the mirror.

As the waiter stands in front of the mirror, he may think he sees a black speck on his shirt. When the speck seems to resist being wiped away, the waiter concludes ‘That is not there; the speck is on the surface of the mirror’.

Consider a detective who sees a necklace thief in a funhouse mirror maze. He can locate the necklace as being on the thief’s neck but he cannot locate the thief within the funhouse. When the detective says ‘That is not there’ we charitably interpret him as denying that the necklace is where it appears to be within the funhouse. We spurn the interpretation in which he denies that the necklace is where it appears to be relative to the thief’s body.

Our familiarity with mirrors explains a side-anomaly about ‘there’. Deferred ostension occurs when the speaker refers to an object by pointing at an associated object. For instance, I point to the empty chair normally occupied by my most outspoken student and say ‘That student is not present’. When Madam Ch’u Changsha of Hunan Province needed medical assistance in 1906, she preserved her modesty by pointing to a doll’s parts to indicate where she felt pain (Newman 1988, 10). She was following a three hundred year Chinese tradition of using diagnostic dolls. With this use of replicas in mind, consider the following puzzle about pointing: We are dining face to face and you notice some sauce on the right side of my mouth. You locate it
for me by pointing at the left side of your mouth. If you were simply using positions on your body to simulate positions on my body, then you would point to the right side of your mouth. What is going on?

Perhaps you are simulating my reflection. Although your sauce pointing is an everyday courtesy, it embodies sophistication about how to indicate what is where.

**Double Uses of a Demonstration**

A subject’s field of vision is the sum of all he sees. But what does he see? Only surfaces? Only private mental entities? Only public objects? Are we talking about what the subject actually sees or what he can see?

The content of a visual field is also influenced by the purposes for which it is invoked. If our purpose switches from artistic depiction to camouflage design, we may switch visual fields as a geologist might switch from a topographic map to a road map. We will simplify and idealize the viewer to suit the goals at hand.

The goal of a demonstration is to get the speaker and hearers to co-identify an object of interest. This goal is best achieved through teamwork. This collective aspect is salient to anthropologists observing hunter-gatherers singling out prey. But it is also evident when observing people drawn together by a distant spectacle. Generally, the speaker takes the lead because he first noticed the object. However, in a minority of cases the speaker relies on spotters to consummate the identification. An old hunter-gatherer may know the terrain well enough to point in the direction of a wounded deer. His pointing helps others see the deer. To exploit the clue, the others try to figure out what the old man would see were he not near-sighted.

Our hunter-gatherer ancestors needed to answer the counterfactual question ‘What would the speaker have seen?’ in a fast, orderly way. Ground rules help. Perhaps the rules first arose as conventions. After the conventions took root, they may have become hard-wired.

Developmental psychology provides evidence that the rules are triggered rather than learned. There is a stereotyped progression in the skills of joint attention. Babies start with mutual gazing. Second comes the ability to follow the gaze of another person as it passes to an object. As the baby begins to reach for objects, adults help by retrieving inaccessible items for the child. This encourages the third step of “imperative pointing” in which the child’s outreached hand indicates a request for an object. Finally comes declarative pointing in which the child points at an object such as the moon independently of any immediate desire for it.

Chimpanzees do not engage in declarative pointing. Perhaps this is because they do little hunting. Declarative pointing has not been observed in the animal kingdom. Declarative pointing may be unique to *homo sapiens*. 
The uniqueness becomes more plausible if declarative pointing is characterized in terms of common knowledge or communicative intentions. Dogs exploit the gaze direction of other dogs. But it is less plausible that a pointing dog intends other dogs to look in same direction because of their recognition of its intention.

In any case, speedy interpretation of declarative pointing requires rules that were later dis-interred by inquisitive people. Euclid took himself to describing how visual rays move from objects to the eye. But he was actually adapting the rules governing demonstrative pointing to answer the question ‘What do we see?’. These rules developed prior to physics and biology. So the geometrical visual field contains false positives (implying we see things that we do not) and false negatives (implying we do not see things that we do).

Why do we continue to use demonstrations geometrically? First, the misleading effects are outweighed by its value as a heuristic. By ignoring the complications of refraction, time lags, and physiology, we get a simple, fast approximation of what is seen by a normal human being. Second, the geometrical use of demonstratives expands the range of reference. We can point through optical barriers (McGinn-style) and ignore the limitations imposed by the speed of light. Of special interest in this expanded range of reference is our ability to point to places. Places are causally inert. Given the causal theory of perception, they cannot be seen. The geometrical use of demonstrations frees us from causal limits.

The causal use of demonstrations (Devitt-style) only lets us identify places indirectly by locating their occupants. The limits of the method depend about what counts as an occupant. The paradigm case of an occupant is a material object. But, as G. E. Moore observes, we also see immaterial entities such as shadows and holes. Holes differ from places because they can move through space. ‘That hole is not there’ can be true but ‘That region of space is not there’ cannot be true.

We use ‘there’ to refer to places relative to the speaker. In this sense, ‘there’ picks out apparent places. They are public places—just places described from the speaker’s point of view. Even if the speaker has a priori knowledge of the places in his visual field, his hearers do not know those places a priori. They need overt gestures and descriptions. Pressure to operationalize communication will make the speaker “strictly liable” for his demonstrations (as in the Spiro Agnew case).

The demonstration governing ‘there’ is always used geometrically. The seeing involved in this use of a demonstration is hypothetical. For instance, a blindfolded man can pick out his dance partner by pointing at her. Although he cannot see which woman he is pointing at, others can see. The blindfolded man achieves reference even if the onlookers were distracted and failed to see which woman he selected. What matters is what the blindfolded man would have seen.
‘That is not there’ is never true when the demonstration is only used geometrically. To get true utterances of ‘That is not there’, the demonstration must be used causally to pick out the object that is actually perceived by the speaker. Since ‘there’ always uses its demonstration geometrically, the demonstration is being used in two ways at once (causally by ‘that’, geometrically by ‘there’). This visual pun overlays the intromissive visual field with the extromissive visual field.

Despite all the potential for confusion about how to situate ‘there’ we rarely get confused. Grice’s maxim of informativeness predicts that speakers will steer away from redundant readings of ‘That is there’. Therefore, people will routinely make use of multiple visual fields—and thereby become adept at juggling divergent demonstratives.

References

Strawson, Peter (1959) Individuals London: Methuen.