Abu Ali al-Hasan ibn al-Haytham
The Optics (1011-21)

The Optics of Ibn Al-Haytham, Books I-III: *On Direct Vision*, tr. A. I. Sabra. London: The Warburg Institute, University of London, 1989, pp. 114-20 (excerpt)

Natascha Sadr Haghighian
Parallax

The eleventh-century treatise on optics by the Baghdadi polymath al-Haytham is an extensive study on how light, vision, and the eye work together. Paramount to al-Haytham's project was a desire to expand upon Aristotle's phenomenological theory of vision, and consequently, to provide a grounded mathematical basis for these interactions, thus transforming a metaphysics of visuality into a physics of the visible. Once translated into Latin, *The Optics* arrived at Italy in the thirteenth century, bearing significant influence on later artists and architects, such as Lorenzo Ghiberti, Fillipo Brunelleschi, and Leon Batista Alberti, all of whom were the founding fathers of the theory of perspective. The articulation and application of perspectival theory in Renaissance painting would have profound implications for the course of Western thought and, in particular, introduce a secularizing, humanizing, centralizing approach to scientific knowledge. Perspective, deployed as part of a strong belief in an ability to represent the world, offered practitioners full capacity to depict "reality" as it truly is. This "objectivity" would use reason and measurement to conquer, categorize, manage, and, in effect, fully understand the world, with humans occupying the central view. Natascha Sadr Haghighian's practice tackles these regimes of perspective and the distribution of "schools of seeing." Her essay departs from

the incongruence generated around vision as it extended into contemporary communication technologies. Taking the example of a Skype conversation on a tablet device, where the interaction between body and apparatus, camera and eye results in the live streaming of images that connect two individuals remotely, Sadr Haghighian questions the simulacrum itself. First she acknowledges the awkward physicality that is enforced, indeed its dire negation of how the eye sees (or even, wants to see), and then she turns her attention to the contradictions of representation, replication, and the impossible promise of the virtual world of "face-to-face" communication. Such media processes, dedicated to full exposure, operate dangerously as part of a greater "sameness project," homogenizing today's structures of relation as well as our human capacity to relate to each other.

Ibn al-Haytham
(965-1040), or Alhazen in the Latinized form of his name, was a Baghdadi polymath, scientist, mathematician, astronomer, and philosopher working at the Arab Persian Abbasid court. He conducted extensive research in the field of optics, establishing connections between astronomy, mathematics, and visual perception. A significant commentator on Aristotle's Arabic translations, al-Haytham's thinking, as re-encountered in Europe during the Renaissance, would contribute greatly to the development of the scientific method.

Natascha Sadr Haghigian's
research-based practice encompasses a variety of forms and formats, including the exploration of contemporary modes of vision and the potentials of the mimetic faculty. She uses a variety of media to create situations in which experiences and propositions resulting from the research can be shared; among them are large (sound) installations, texts, and performance as well as video. The text "Parallax" is part of ongoing research into techniques of "looking awry."

Abu Ali al-Hasan ibn al-Haytham
The Optics

Chapter 2
On Distinguishing the Lines of the Ray

[1] It was shown in the First Book that the radial lines through which sight perceives visible objects are the straight lines that meet at the centre of the eye. And it was shown in [the chapter on] The Structure of the Eye that the sentient organ, i.e. the crystalline humour, is set at the extremity of the nerve's cavity where the whole eye is mounted, and that the bending of this nerve, when it bends, takes place behind the eye's centre and behind the whole eye at the aperture in the bone's concavity.

[2] It was also shown that the straight line passing through all centres of the eye's coats extends through the cavity of the nerve, rectilinearly reaching the middle of the bend in the nerve's cavity where the eye is set, and passes through the aperture in the uvea's front. It was shown, too, that the position of this line does not vary in relation to the eye as a whole or to the surface of the eye's coats or to the eye's parts. Thus the straight line that passes through all centres of the eye's coats always extends rectilinearly to the bend in the nerve's cavity, where the eye is set, regardless of whether the eye is in motion or at rest. And since this line passes through the centre of the eye and that of the aperture in the uvea's front, it extends through the middle of the cone, the vertex of which is the eye's centre and which is surrounded by the circumference of the aperture in the uvea's front where the forms come to the eye. Let us call this line 'the axis of the cone'.

[3] It was also shown in the First Book that the cone formed between the visible object and the eye's centre cuts off from the crystalline's surface a part which contains the whole form of the object at the base of that cone; and that the form is ordered in this part of the crystalline's surface by means of the radial lines extending between the object and the eye's centre, so as to have the same arrangement of parts of the object's surface; and that the crystalline only senses the object and the form that is ordered in this part of its surface. Thus, when sight perceives a visible object whose form occurs in that part of the crystalline's surface which is contained by the cone produced between the eye and that object, then every point of the form produced in this part of the crystalline's surface will be on the radial line that extends from that point to the corresponding point on the object's surface and on which the form has rectilinearly arrived at that point in the crystalline's surface. If the form of the object is at the middle of the crystalline's surface, then the axis we mentioned will be one of the lines along which the forms of points on the object's surface have rectilinearly arrived, and the point on the object's surface at the extremity of this axis will be that whose form has passed along the axis.

[4] And it was shown in the First Book that the forms which sight perceives of visible objects extend through the body of the crystalline and through the cavity of the nerve on which the eye is set, reaching the common nerve at the middle of the brain's front where the last sentient perceives the forms of visible objects; and that vision is accomplished only when the form reaches the common nerve; and that the forms' extension from the crystalline's surface through the crystalline's body takes place along the radial lines alone, since the crystalline receives these forms only along the directions of the radial lines.

[5] Now the last sentient perceives the positions of the object's parts in accordance with their order in the object's surface. And if the relative positions of the parts of the form which occurs in the crystalline's surface are the same as those of the parts of the object's surface; and if the form extends through the body of the crystalline and through the cavity of the nerve until it reaches the common nerve; and vision is not accomplished until this form has reached the common nerve; and the last sentient perceives the object's form only from this form upon its arrival at the common nerve; and, further, if the last sentient perceives the positions of the object's parts unchanged; then vision is not accomplished until after the form which occurs in the middle of the crystalline has reached the common nerve with the positions of its parts as they are on the crystalline's surface without any change having occurred in any of them.

[6] Now the form cannot reach the common nerve from the crystalline's surface unless it extends through the cavity of the nerve on which the crystalline is mounted. If the form does not occur in the cavity of this nerve with its own structure, and with the positions of its parts unchanged, then it will not be possible for it to extend from the crystalline's surface to the nerve's cavity along the radial lines with the positions of its parts unchanged. For these lines meet at the eye's centre, and if they rectilinearly extend beyond the centre their positions will be reversed, so that those on the right will be on the left and *vice versa*, and the higher ones will be lower and vice versa, as is the case with all lines that intersect in a point. If, therefore, the form extends from the crystalline's surface along the lines of the ray, it will come together at the centre of sight and the form will thus become one point. Now the centre of sight lies in the middle of the whole eye and before the bend in the nerve's cavity. If, therefore, the form

extends from the centre as one point along one line, it will reach the bend in the nerve's cavity as one point and there will be no form in the nerve's cavity. And if it extends along the radial lines beyond the centre, it will be reversed according to the reversal of the intersecting lines on which it extended. Thus when it reaches the nerve's cavity after going beyond the centre it will arrive in a reversed position. The form cannot, then, reach the nerve's cavity from the crystalline's surface with the positions of its parts as they are if it extends along the lines of the ray. And, therefore, the form can only reach the nerve's cavity from the crystalline's surface, with the positions of its parts unchanged, along refracted lines which intersect the lines of the ray.

[7] But if vision is accomplished only when the form which occurs in the crystalline's surface reaches the common nerve with the positions of its parts unchanged; and if this form cannot reach the cavity of the nerve with the positions of its parts unchanged except by being refracted, then vision is not accomplished until after the form which occurs in the crystalline's surface has undergone refraction and extended along lines that intersect the radial lines, this refraction having taken place before the form reaches the centre, because if it were refracted after passing the centre it would be reversed.

[8] Now it has been shown that these forms pass through the body of the crystalline along the lines of the ray. And if so, and if it cannot reach the nerve's cavity until after it has been refracted along lines that intersect the radial lines, then the form will be refracted only after it has passed through the crystalline's body. But the form cannot be refracted in the body of the crystalline when all conditions of the latter are as they are. [For] it has been shown in [the chapter on] The Structure of the Eye that the crystalline's body is of varying transparency, its posterior

part, called vitreous, being of different transparency from the anterior part. No part of the crystalline's body is of a different form from that of its anterior part other than the vitreous body. And it is a property of the forms of lights and colours that they are refracted when they meet a body, the transparency of which differs from that of the first body in which they are. The forms, therefore, will only be refracted upon reaching the vitreous humour. This body is in fact of a different transparency from the anterior part of the crystalline so that the forms may be refracted upon reaching it.

[9] It follows that the surface of this body must be placed before the centre of the eye, so that the forms may be refracted at it before going beyond the centre and thus preserve the same structure which they have in the object's surface. And it follows that this surface [of the vitreous] must be similarly ordered, because if it were not, the form would be disfigured after being refracted at it. Now a similarly ordered surface is either plane or spherical. But that surface cannot be part of a sphere whose centre is the eye's centre, because if it were, the lines of the ray would be perpendicular to it and the forms would rectilinearly extend upon reaching it and would not be refracted. Nor can it be part of a small sphere, otherwise the form would be disfigured once it extended a little behind it after being refracted at it. This surface must, therefore, be part of a plane surface or part of a fairly large sphere whose sphericity does not affect the form's order, and its centre must not be the centre of the eye.

[10] Thus the surface of the vitreous humour, namely the common section between this body and the anterior part of the crystalline's body, is a similarly ordered surface which is placed before the eye's centre. And all forms which occur in the crystalline's surface extend in the crystalline's body until they reach

this surface. When they do, they are refracted at it along similarly ordered lines that intersect the lines of the ray. For the forms of visible objects are ordered by means of the lines of the ray at the crystalline only, since it is at this organ that sensation begins. And it was shown in the First Book that, given the largeness of the object and the smallness of the sentient organ, the forms of the object cannot be ordered in the surface of the eye except by means of these lines. Thus these lines are an instrument of sight through which sight achieves perception of the visible objects as they are, though the forms need not extend along these lines to reach the last sentient, and it has now been shown that the forms cannot extend to the last sentient along these lines.

[11] Moreover, the reception of forms by the sentient organ is not like their reception by transparent bodies; for the sentient organ receives these forms and senses them, and the forms penetrate it on account of its transparency and the sensitive power which is in it, and therefore it receives these forms in the manner proper to sensation, whereas transparent bodies receive them only in the manner proper to transmission without sensing them. And if the sentient body does not receive these forms in the same way as they are received by non-sensitive transparent bodies, then the extension of forms through the sentient body does not take place along the lines required by transparent bodies; rather, the forms extend in accordance with the extension of the parts of the sentient body. Thus the eye is characterized by receiving the forms through the lines of the ray alone because it is a property of the forms that they extend in transparent bodies along all straight lines and, consequently, they arrive at the eye along all straight lines; if, therefore, the eye received the forms along all the lines on which they arrive, the forms would not be [correctly] arranged in the eye. The eye is thus characterized by

receiving the forms along these [radial] lines alone in order to sense the forms in the arrangement they have in the surfaces of visible objects. Then, when the forms occur in the sentient organ in their [correct] arrangement, and the sentient organ perceives them as [correctly] arranged, nothing remains afterwards that cannot be accomplished except by means of these lines. Thus the occurrence of the forms in the sentient body is not like their occurrence in transparent bodies, for the lines of the ray are merely an instrument by means of which the crystalline's sensation is achieved.

[12] It was shown, moreover, that the forms cannot extend beyond the crystalline along the lines of the ray, but are rather refracted upon leaving the crystalline, this refraction taking place upon their arrival at the vitreous humour, and that the extension of the forms in this latter body takes place along refracted lines and not rectilinearly along the lines of the ray. It follows that the vitreous body is not especially concerned with the directions of the lines of the ray. Thus it is only the anterior part of the crystalline that especially receives the forms along the lines of the ray. But the posterior part, namely the vitreous, and the receptive power in this [latter] body, in addition to sensing these forms, are especially concerned only to preserve their arrangement. That being the case, the manner in which the vitreous receives the forms is not like the manner in which the anterior part of the crystalline receives them, nor is the receptive power in the vitreous the same as that in the anterior part.

[13] But if the way in which the vitreous receives the light is not the same as that in which the anterior part receives it, and if what is required by the vitreous is not the same as the crystalline's requirement, then the refraction of the forms at the surface of the vitreous must be also related to the difference in

the manner of sensitive reception between these two bodies. The forms are therefore refracted at the vitreous on two accounts: one is the difference in transparency between these two bodies, and the other is the difference in their manner of sensitive reception.

[14] Now transparency only differs in these two bodies so that the property required by transparency may agree with the property required by the difference in the manner of sensation, so that the form may retain its structure. If, however, the transparency of the two bodies were the same, then the form would extend into the body of the vitreous along the lines of the ray on account of the similarity in transparency, and the form would be refracted on account of the difference in the manner of sensation, and after refraction it would either be confused because of this, or become double. But if the difference in transparency requires that the form should be refracted, and the difference in the manner of sensation requires that it suffers that [same] refraction, then the form will remain after refraction as one form having the same structure. It is for this reason, therefore, that the transparency of the vitreous body differs from that of the anterior part of the crystalline. The forms thus arrive at the vitreous in the arrangement they have in the surface of the visible object. The vitreous receives them and senses what is in them on account of its sensitive power. Then the form suffers refraction in this body on account of the difference in transparency and on account of the difference in its manner of sensing the form. Thus the form occurs in this body with the structure it already possessed, and then this sensation and this form extend into this body and into the body connected with it until sensation and form reach the last sentient with the structure of the form unchanged. Thus the extension of sensation and form in the vitreous body and in the

sentient body that fills the cavity of the nerve to the last sentient resembles the extension of the sensation of touch and of pain to the last sentient.

[15] Now the sensation of touch and of pain extends from the organs only through the filaments of the nerve and through the spirit extending within those filaments. So when the forms of visible objects occur in the body of the vitreous humour and are sensed by this organ, the sensation extends from it into the sentient body that fills the cavity of the nerve that joins the eye and the front of the brain. The form extends, along with the extension of the sensation, while preserving the arrangement of its structure and the [relative] positions of its parts. For it is in the nature of the sentient body to preserve the arrangement of these forms. And this arrangement is preserved in the sentient body because the parts of this body that receive the parts of the forms, and the distribution of the receptive power that exists in the parts of the sentient body, are similarly arranged in the vitreous body and throughout the subtle body that fills the nerve's cavity. That being so, when a form arrives at any point on the surface of the vitreous, it runs along a continuous line the position of which remains unchanged in the nerve's cavity through which the sentient body extends. Thus all the lines on which all points in the form run, will be similarly arranged relative to one another; and while these lines bend along with the nerve, they keep the same arrangement after as before they bend on account of the manner of sensation in this body. The form therefore arrives at the common nerve with its own structure and with no change in its arrangement. There is no other way in which the forms of visible objects can extend to the last sentient, for the forms cannot reach the common nerve with their own structure [unchanged] unless their extension takes place in this manner.

[16] Since the forms extend according to this arrangement, the form that occurs at any point on the surface of the crystalline will always extend on one and the same line to one and the same point in that place in the common nerve where the form occurs—because the form that occurs at any point on the surface of the crystalline always ends up at one and the same point on the surface of the vitreous. From which it follows that from any two points that are similarly situated in the eyes, two forms will extend to one and the same point in the common nerve.

[17] It also follows that some transparency exists in the sentient body that fills the nerve's cavity so that the forms of lights and colours would appear in it, and also that its transparency must be similar to that of the vitreous humour so that the forms may not be refracted at their arrival at the posterior surface of the vitreous close to the nerve's cavity. For if the transparency of these two bodies is the same, the forms will not be refracted; and they cannot be refracted at this surface, since it is a spherical surface that belongs to a small sphere; for if the forms were refracted at this surface, they would be disfigured once they went a little behind it; and, therefore, the forms cannot be refracted at this surface.

[18] Now if the transparency of the sentient body that exists in the nerve's cavity differed from that of the vitreous, this difference would inevitably cause the form to be confused. And if the form extends where the sensation extends, then the transparency of the sentient body that exists in the nerve's cavity cannot differ from that of the vitreous body. This body does not possess transparency in order that the forms may extend through it in the directions required by transparency; rather, it has transparency in order that it may receive the forms of lights and colours and in order that the forms may appear in it. For a body does not

receive light and colour nor is it penetrated by their forms unless it is transparent or has some transparency in it. And light and colour cannot appear in a transparent body unless it has some density in it, in addition to its transparency. The same is true of all bodies that are capable of receiving lights and colours and in which these may appear; and for this reason the crystalline is neither extremely transparent nor extremely opaque.

Therefore, the sentient body that exists in the nerve's cavity is transparent and also has some density in it; the forms go through this body by virtue of what it has of transparency, and they appear in it to the sensitive faculty by virtue of what it has of density. The last sentient perceives the forms of light and colours only through the forms that occur in this body upon their arrival at the common nerve, and it perceives light through the illumination that occurs in this body. It is in this manner, then, that the forms reach the last sentient and are perceived by it.

Natascha Sadr Haghighian
Parallax

I am in a random generic hotel room in Minneapolis, in Boston, or in Dubai. You are in Tehran, in Cairo, in Ramallah, or in Taipei. The AC is killing me and I don't know how to turn it off. I need to talk to you, I need to see your face. I look for you on Skype.

>are you there?

(5 minutes later)
<yes

>can we talk?

<give me 5 min

Most of the time, some of the people that I feel close to are far away. Distance becomes a mode of my physical experience and its expression, as thoughts, desires, needs, and energies radiate out

into space, sometimes conveniently along existing trajectories. How can I measure the distance between me and you? How can I measure distance at all?

The hotel room does not provide any point of reference. Climatized air, minibar carrying the usual brands, stock photography on the walls, satellite television on a plasma screen, the view, usually a fire wall or another generic building. It looks the same as all the other hotel rooms, and I suspect that this generic sameness is, in fact, intentional, intending to overcome distance, to melt down the distinctions and discrepancies between places into a "Not Other." It suggests that the only thing that can't be leveled is the time zone you've arrived in; everything else is either delocalized or taken care of by your GPS.

After some minutes, you call. The hotel room turns from alienating to ludicrously funny. I show you around. We make jokes about the cheesy artwork on my wall; you tell me about the elections. Your face on the display of my tablet is a known coordinate, a familiar reference to my eyes. I even seem to see the details that the camera is unable to display. My location becomes more tangible as you become part of it. It is night here, day there.

>I miss you.

<I miss you, too.

I notice that the rays of light emanating from the window behind your face light up my face and the wall behind me. The immediacy of the impact makes distance convolute and collapse in front of my eyes.

Consumer telecommunication devices are part of the sameness project. The devices include those applications we use to see, visualize, communicate our location, our view and views, our desires and needs. The devices we use to stay in touch with friends, family, work, and the world are standardized, tuning into the same sameness of the hotel room, or other things that populate this project, like the paper coffee cup or the cabin luggage. Funnily enough, we use telecommunication devices excessively even if we're in the same city, in the same neighborhood, even in the same bar. The distance becomes relative, a parameter that we can choose to hide in most (geo)social networking applications.

I sit on the bed, leaning against the wall, my legs pulled toward me. We speak, we look, we tell. I hold the tablet in one hand, backed by my legs; the streamed image of your face fills the screen now, with a little window in the lower right-hand corner that displays my own face. The connection is good. Almost no delay, no scrambled pixels. Yet while I listen to you, I notice that my eyes keep skipping

from your face to my picture in the lower corner. I'm distracted by the changing intensities of light on my face when the daylight behind you bursts through along the contours of your face. The rays hit the camera in your tablet, shoot up to the satellite, shoot down into the router of my hotel and onto my display, striking my face seemingly in a straight line. It almost feels like a touch. But what distracts me even more is that, while you are talking to me, you aren't looking at me but slightly to the left, as if you are looking at incoming emails, or other chats on Skype. Did I interrupt you in something when I asked you to call? Trying to evaluate the situation, I scan your face, your voice, and your body movements for signs of distraction or inattention. It's hard to tell. I discover that my face in the lower corner has the same skewed gaze. I start tracing our gazes to understand what I am looking at, what you are looking at. It is challenging, if not confusing, because of the many eyes involved: my eyes, your eyes, your tablet's camera eye, my tablet's camera eye, my eyes on the screen, your eyes on the screen, my eyes on your screen, your eyes on my screen. Palpating the lines between all those eyes, I first of all detect the divergence of position of each eye, especially the discrepancy between the position of the camera and the window displaying both our faces. I look into the camera of my tablet to check whether my gaze would now straighten, but I fail to stretch or divide my vision between the two differing coordinates, so I can't check unless I make a screenshot of my screen while focusing the camera. You interrupt my experiment:

<what are you doing? are you reading your email?

>no, I'm sorry dear, I just tried to figure something out. go on.

Consumer telecommunication devices commonly have built-in cameras. The position of the camera is either above, on the side, or in the corner of the screen, which results in a parallax. Viewpoint *a* looks at the image of viewpoint *b* and viewpoint *b* looks at the image of viewpoint *a*, but both seem to be looking to the side, seemingly avoiding eye contact.

This parallax results in an impalpable sensation of absence or confusion as to where the other person is actually looking and whether they are paying attention or reading their email on the side.

> "I'm an eye. A mechanical eye. I, the machine, show you a world the way only I can see it. I free myself for today and forever from human immobility. I'm in constant movement. I approach and pull away from objects. I creep under them. I move alongside a running horse's mouth. I fall and rise with the falling

and rising bodies. This is I, the machine, manoeuvering in the chaotic movements, recording one movement after another in the most complex combinations.

"Freed from the boundaries of time and space, I co-ordinate any and all points of the universe, wherever I want them to be. My way leads towards the creation of a fresh perception of the world. Thus I explain in a new way the world unknown to you."[1]

John Berger's voice quoting Dziga Vertov resounds in my head like a scratchy old tune. There it is, the mechanical eye that seems to coordinate any and all points of the universe, free from the boundaries of time and space. It prosthetically helps me to see you at a far distance and (almost) in real time, yet it wondrously creates new and disorientating spaces in between your eyes and my eyes.

Once I discover that the diversion of your gaze is due to this parallax, I self-consciously try to correct my own gaze by looking at the camera instead of at the image of your face. I can't help trying to check my own image in the lower right-hand corner constantly, in a desire to somehow bundle these lines of vision. As if I could outsmart the system and catch my own gaze if I just switched fast enough, or looked out of the corner of my eye. Obviously, this results in dizzying and conflicting eye movements. But the wish to converge these lines goes even further: if only we could look each other in the eye, make actual eye contact. But if you look into the camera to look at me, you will turn away from me looking at you. It's technically impossible to lock eyes. In the attempt to lock eyes, you go crossed-eyed. One aspect of the seeing process will always happen in the corner of the eye, dispersing our gaze, and making us look awry.

My attempt to synthesize the gap that occurs in my vision when I try to overcome the distance between me and you fails for technological reasons that are known. Eye contact or "mutual gaze awareness" in video conferencing is seen as vital for effective communication between two parties. The known problem of disparity between the locations of camera and subject in consumer-level setups is one of the priorities in developing new software that generates a real-time gaze correction. One of the approaches is to render a gaze-corrected 3-D model of the scene and, with the aid of a face tracker, transfer the corrected facial portion in a seamless manner onto the original image. The resulting assemblage supposedly looks "natural," as if the person actually made eye contact.[2] These kinds of prosthetic approaches for providing seamless images of an assembled body are increasingly common in film as well, especially in the complex legal considerations involved in explicit

sex scenes. The various body parts—such as the upper body and the genitals—belong to different individuals and are filmed separately. Later, they are (re)assembled in postproduction; when they appear on the screen, the montage is untraceable. Interestingly, the production of such scenes is vividly discussed in the media,[3] yet viewing the film and the discussion around its "making of" are viewed from two different viewpoints. The paradox in knowing that a famous actor did not expose her vagina to the audience, while nevertheless seeing a seamless body perform the act on screen, constitutes a parallax in one's vision, an irreducible gap that is a pivotal aspect of contemporary seeing.

The parallax dimension in the explicit sex scene creates a gap, separating two simultaneous positions from where one looks, or two coinciding viewpoints. The same gap seems to occur in my Skype experience. According to Kojin Karatani, quoted in Slavoj Žižek's "Parallax View,"[4] this parallax gap occurs in antinomies, like that of production and consumption. It should be asserted as being irreducible. All attempts to reduce one aspect of it to the other should be renounced. Karatani suggests that this interstice—the parallax gap—is the point of radical viewing and reflection, where one does not see things from one's own viewpoint, or from the viewpoint of another, but instead faces the realities that become visible in the parallax. It is the radical position of not viewing one determinate position in opposition to another, rather of thinking and acting from the structural interstice in between.

From the vantage point of radical viewing, I start to appreciate the conflict in my vision when I try to see you and see what makes me see you. Not leveling distance, but reinstating a capacity for strangeness that allows a tangible experience of the distance between bodies. A distance that can constitute an irreducible gap of its own. After all, we communicate from and between coordinates that are not only set apart in terms of time zones, but often constitute highly complex political, economic, and social contextual gaps. There are times when the Skype connection bridges what would otherwise be insurmountable gaps or borders. Bodies are kept in check and often prevented from crossing borders, depending on

1 Dziga Vertov, 1923, quoted in John Berger, *Ways of Seeing*. London: BBC and Penguin Modern Classics, 2008, p. 17.
2 C. Kuster et al., "Gaze Correction for Home Video Conferencing," *ACM Transactions on Graphics*, vol. 31, no. 6 (2012), pp. 174:1–6, graphics.ethz.ch/publications/papers/paperKus12.php.
3 Emine Saner, "From *Nymphomaniac* to *Stranger By the Lake*, is Sex in Cinema Getting Too Real?" *Guardian* (February, 21 2014), theguardian.com/film/2014/feb/21/nymphomaniac-stranger-by-the-lake-sex-cinema.
4 Slavoj Žižek, "The Parallax View," *New Left Review*, vol. 25 (January–February 2004), newleftreview.org/II/25/slavoj-zizek-the-parallax-view.

which economy they belong to, yet all the while they are allowed to overcome distance through social media and telecommunications. The gap between the bodies involved in a movie's sex scene is also based on assumed value. The body of the Hollywood actor and the body working in the adult industry are part of different currencies within this value system. The antimonies of production and consumption in the Hollywood movie are instantly rendered intangible when the assembled bodies strike the screen. Yet, my body aches when I experience these gaps and sense the forces that create them.

I agree that the strangeness of not interlocking eyes with you is painful, yet it helps to prevent a conflation or collapse of space and of antimonies. It is promoted as being convenient and more true, as it closes the awkward and unpleasant void that exists between the images of two locations, two bodies, two actualities. The familiarity of the much-longed-for face that I recognize onscreen wants to translate itself into an intimacy, but this same familiarity easily collapses into too-great closeness, obscuring the irreducible gaps. In fact, the gaze correction software[5] that makes it possible to make eye contact does *not* allow you to look away. Your corrected gaze would constantly be switched on, eyeballing me even though you might have turned away. What an awkwardly enforced presence that would be if your body leans over to grab a book while your eyes, still seamlessly affixed, are rendered on a skewed body. The increased sense of trust established through eye contact, what promises to "keep people together" or help make "better business," is forced onto your face and into the way you make contact. Maybe such visual apparatuses, promising an instant and unrestricted bridging of distance, granting access to the banality of the continuous stream of the everyday, even if we're far, far away, can in fact be blinding. The parallax, instead, reintroduces the capacity of seeing strangeness, of discovering and experiencing looking as a painfully pleasurable, obscene, and complicated act, moved by forces inhabiting the domain of *jouissance*: the domain of wonder. Here, apparitions appear, figures that demonstrate the forms askew on the margins of perception—not the realm of the visible, but the sense of the visual, in the literal sense, on the margins of our ability to see images.

<I have to go, honey. I have a meeting at 1.

>oh yeah, sure. I forgot it's daytime over there. can I read you something before you go?

<sure!

ok. "Each substance of grief hath twenty shadows,
Which show like grief itself, but are not so.
For sorrow's eye, glazed with blinding tears,
Divides one thing entire to many objects;
Like perspectives, which rightly gaz'd upon
Show nothing but confusion; ey'd awry
Distinguished form: so your sweet majesty,
Looking awry upon your lord's departure,
Finds shapes of grief more than himself to wail;
Which look'd on as it is, is nought but shadows
Of what is not."

<this is beautiful. who is it?

>Shakespeare[6]

<ok honey, your lord is now departing. don't watch crappy television for too long.

>I won't

<kiss you

>kiss you more

Of course, I ended up watching crappy television until very late, in the hope that I would fall asleep. At some point I gave up and started browsing the Internet. Keywords: ruptured vision, eye contact, propagation of rays, and retina versus mind's eye. I was delighted when I found Nicholas of Cusa had written about sight. In his treatise *De visione Dei* (1458–59), Cusanus uses a painting by his contemporary Rogier van der Weyden to serve as an example for his idea of coincidence between the two categories of vision. The painting depicts an omnivoyant individual Cusanus calls the "Icon of God" (*eiconam Dei*). He suggests gathering around the image with fellow monks, each observing it from his respective position at close range. Astonishingly, to each it will seem that the face is looking at them personally. He describes the marvel of this discovery, especially when one brother changes his position in relation to the image and still finds its gaze moving along with him. This bewildered brother then asks a fellow monk to move while beholding the image; both still find the painting's gaze to proceed simultaneously with them, with equal dedication.

5 The software developers for this application come from Technion, the Israeli Institute of Technology, which has strong ties with the military and focuses on developing technology for military purposes. One wonders how such gaze correction could be applied in this context.

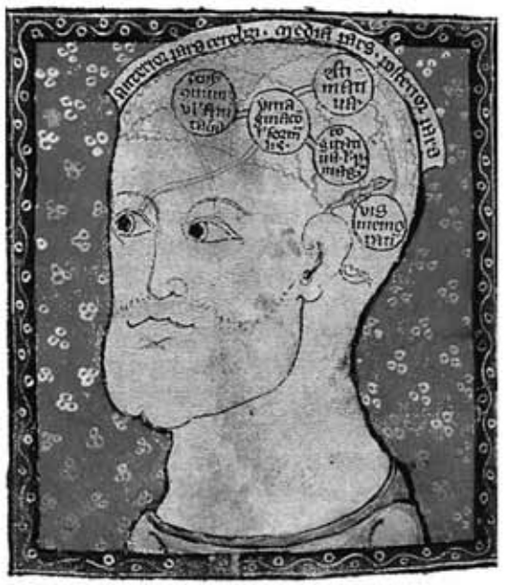
6 William Shakespeare, *Richard II*, Act 2, Scene II.

Cusanus describes this experience—using the term "absolute gaze" (*visus absolutus*) to distinguish a gaze that sees everything at once and in particular, all at the same time—as coming close to understanding the gaze of God. God's sight is uncontracted (*incontractus*), knowing no distance or limited angle. All other sights, including human sight, vary in their limitations, as they are contracted to different degrees. I stumble over the term "contracted sight" (*visus contractus*). Checking the German edition, I find this is translated as "*verschränktes Sehen*," suggesting a sight that is more entangled, folded, or interlaced. The concept of "*Verschränkung*" (entanglement, interlacing, folding) brings me back to my experience of looking awry, of going crossed-eyed in front of Skype.

Unavoidably, it makes me think of the gaze correction application, and, by extension, contemporary forms of absolute vision that find their expression in surveillance programs and policing. Donna Haraway associated this unmarked position of a conquering gaze from nowhere, holding within it the power to see and not be seen, entirely with the position of the white male. The ordinary primate eye has the potential to be endlessly enhanced through technological means, feeding into an ideology of direct, devouring, generative, and unrestricted vision that Haraway connects with established conceptions of objectivity. This eye—using the "god trick"—"fucks the world to make techno monsters." In her essay "The Persistence of Vision," Haraway advocates partial perspective, an embodied objectivity that originates from situated knowledge—modes of seeing that vary, change, adapt, respond, and fold into one another. What is "seen" is a composition, partially from me, partially from you, but also from the computer, the materials that make it, or the objects in the hotel room. People and things, ideas and clouds, participate in observations, destabilizing the fixed view, or the "right view."[7] I assume this comes as close to what I associate with the term "*Verschränkung*."

I write to you:

After we talked I found this. It looks exactly like you when we Skype! :))



→ p. 140.

And I found out more about why, which is the reason why I'm still awake.

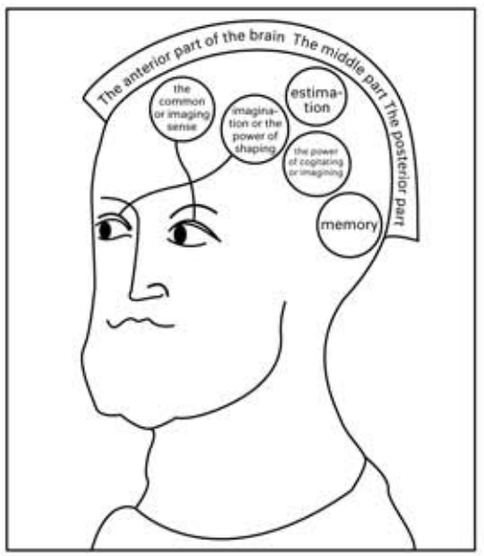
There is a lunar crater named after Ernst Mach. It's on the far side of the moon, which is why we never get to see it. It makes me think of curved vision, or other means for looking around the corner. I know that you're not that far away, but I'm also really not sure how far you actually are. I noticed you can't see when I stroke your face on the screen, but when I told you, you said you could feel it. Anyway, I think I need to do some experiments next time we Skype.

The Shakespeare quote I read to you earlier is about diverted vision. The queen cries because her king had left, and in her tears she sees twenty shadows of his departure. It's quite amazing, because her tears work like crystals that multiply what she can see. I bet it includes several visions of the future, where she worries about what could happen to him out there, but also past memories, of sweet intimacy

7 Donna Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York, NY: Routledge, 1991.

or of a fight they had once. It's as if she can see all of this at once without merging the different visions taking place in each crystal. Her friend wants to comfort her and he tells her to wipe away her tears, for they are compromising her vision, and preventing her from seeing departure for what it is. But she insists on the twenty shadows, on her distorted vision.

Goodnight, honey.



In the drawing above, you see translations of the original inscriptions in the image on page 139. The image comes from an early fourteenth-century manuscript, accompanying a short text entitled "A Description of the Human Head." It diagrams the medieval understanding of how the brain functions and demonstrates that the brain has five "cells," which work together to construct thought and perception. This notion is a refinement of the ancient Greek Galenic tradition through the Islamic polymath Avicenna's commentaries and medical doctrines. Dividing the procedures of thought in relation to vision, the mind is ascribed a seeing power, an image-making power, a thinking power, a sense-perception power, and a power to remember. The eyes act as filters that collect impressions and sensations from the world, understood here as the "imagination." These are taken up and formed by "common sense" into coherent mental images, and later stored in the repository of the mind's eye. The faculties of memory and cognition could then access these images as necessary.