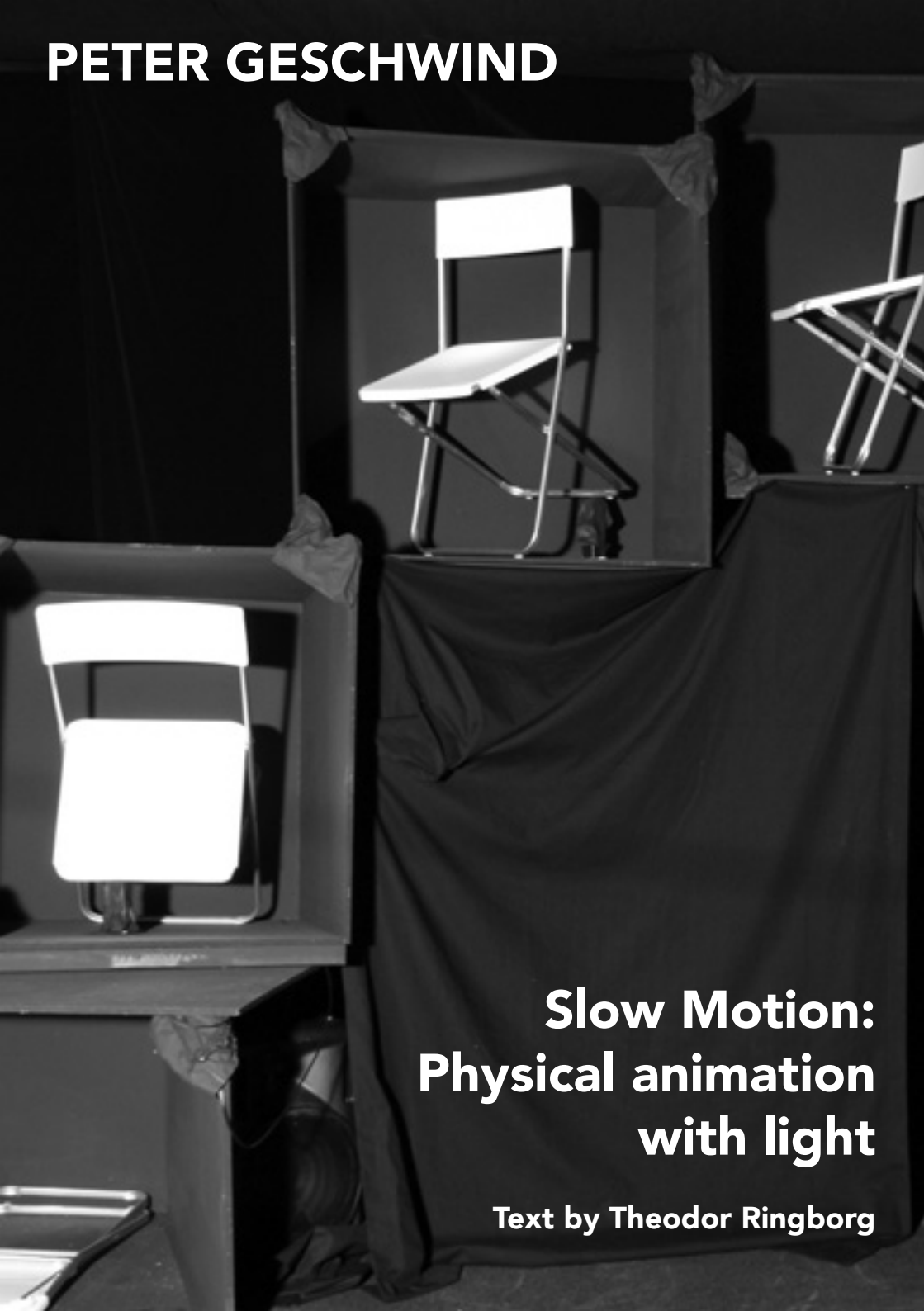
PETER GESCHWIND



Slow Motion: Physical animation with light

Text by Theodor Ringborg

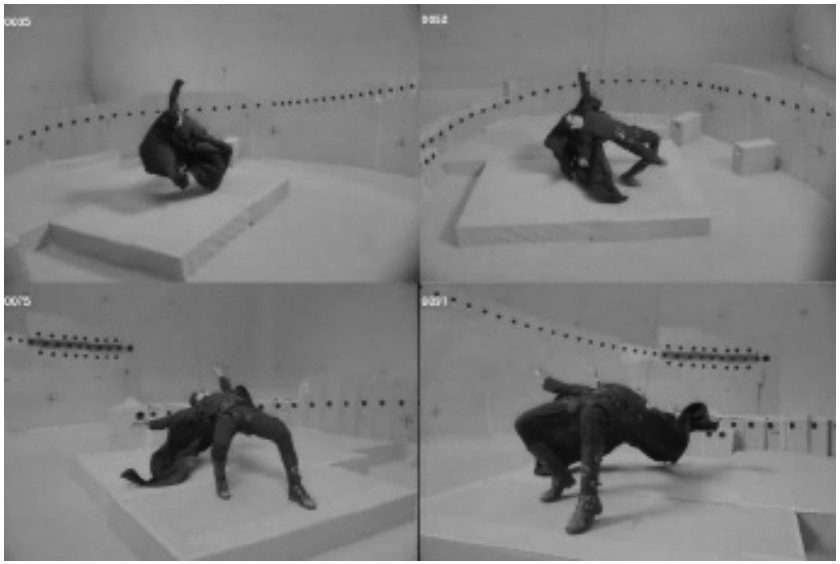
Slow Motion:
Physical animation with light

To reproduce an image of Peter Geschwind's recent series of work would be like printing an image of only one of Eadweard Muybridge's horses. Extracted from its place in order, isolated, it looses what made Muybridge's series significant: a sequence of movement. In the single image there is, of course, an appearance of the horse moving, its hair, for instance, fluttering backward. But alone there is no chronology and thus no decipherable, consecutive movement. On its own, it is a picture of a horse in flight differing little from any other old horse picture.

Geschwind's recent installations work pretty much the same. They hinge on the particular kind of movement we see in Muybridge's work. It's a type

of arrangement through time, and so consequently a "still" is to no avail. The work is, moreover, equally difficult to describe in words. It needs a little bit of imagination. By way of illustration one could say that it is a sort of hybrid between Muybridge's old sequences and that time slice scene in *The Matrix* when the camera swoops around and the protagonist Neo dodges bullets, but in real 3D. That is to say, the work is an illusion of apparent movement, but one that takes place in actual space and uses real tangible things, so the viewer, rather than looking at a screen, is deeply immersed in what's happening.

The first of Geschwind's works in this series is called *Slow Motion* and was exhibited at Gävle Konstcentrum in 2011. The series, comprised so far of two installments, relates back to the very first optical experiments but aims at turning the relationship between space and movement inside out. Regarding specifically *Slow Motion,* it helps to imagine Muybridge's horses, each one representing a stage in a progressive movement. Imagine them in a circle around you, almost like carousel horses, but in a pitch-black room, a room so dark that the only way you can see anything is by using a flashlight. Imagine then that you shine the flashlight at one horse at a time, in a sequence. If you do it in a plodding rhythm they'll change, sure, but it's still very much different horses. One could maybe equate it to watching a slide show. It would be pretty lame. But shine the light on each one a little faster and they melt together in movement, like a film. The horse before the next will begin to appear as if it's linked to the one after that, and the one after that, too. The illusion of movement comes into being. Instead of several different horses around you (slide show), it's now a single beguiling one frantically galloping up and down in a circle (film). It moves, in harmony, because of the speed with which you're shining your light onto it. But, more than anything, it is doing all that because of the way your brain is wired.

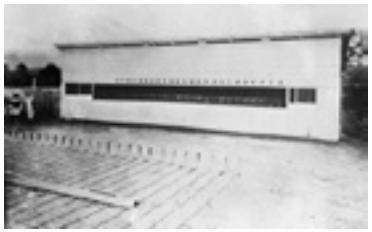


If you replace the horses with 32 white folding chairs that each incrementally change their folded position, placed in individual black boxes each provided with strobe lights and loudspeakers programmed to circle round and round, it would be kind of what *Slow Motion* was. When I saw it, it was by all appearances a single chair sort of magically circling a darkened room, moving round and round, up and down, from floor to ceiling in sequence, moving as if you could ride it like a rollercoaster only to fold itself up and as if part of an assembly line move back to the beginning of the ride, all in a sort of 3D-real-life-stop-motion-animation. And standing in the middle of this sequence, the urge to follow the movement was irresistible and I ended up twirling around with it, mesmerized by the fact that it really looked like the chair was magically flying freely around. I really didn't understand what I was seeing and in that moment became intimately linked with all other people in history that have faced a new optical experience and become totally mind-fucked by it.

Some experiences accentuate the real to such a degree that they turn the corner to abstract. As if the *out-of-body-experience* had an equivalent *to-the-side-of-objective-reality-experience*.

It was in 1872 that California's then governor, Leland Stanford, hired Eadweard Muybridge to conduct some photographic experiments. Stanford had expressed an opinion on the fiercely discussed question if all feet of a horse were off the ground at the same time when the horse was trotting. Up to that point, when it came to the trot, the way a horse walked had been painted as if one of the feet was always steadfast on the ground, and in gallop front legs shot out in front of the animal and the back legs shot out behind it. Kind of like we might imagine the way a leopard runs. It may seem like a pretty silly question, but no one knew for sure how, exactly, a horse walked or ran, and as Stanford was an avid racehorse owner, he made a plea to Muybridge to get to the bottom of it.

It was later that year that Muybridge resolved the issue with a photographic print of *Occident*, one of Stanford's horses. Muybridge had managed to capture a moment where all of Occident's legs lifted off the ground as it trotted. But Stanford wanted to see a horse in gallop, too, so in 1878 Muybridge fitted the Palo Alto Stock Farm with large glass-plate cameras placed in a long line along the edge of the racetrack. The shutter of each camera was tied to a wire, which the horse tripped as it crossed it, and Muybridge got the shot(s).



What Muybridge did with the resulting prints was to copy them as silhouettes on a round glass plate that looked sort of like an LP, which when spun made up an illusion of the horse's movement. He called the device a *zoopraxiscope*, which today is considered an early movie projector as it advanced the notion of motion pictures. The first version was of course rather crude, but it didn't take long until the stop-motion images were refined and colored, featuring several different kinds of combinations of sequences of movement.

Not to turn this into a history lesson, but the zoopraxiscope was by all accounts one of the chief sources of inspiration for Thomas Edison and William Kennedy Dickson's Kinetiscope, which was the first commercial motion picture exhibition system. The Kinetoscope was an early device for film, though not a projector as such. Rather, viewers looked through a hole as a strip of film ran inside it. Sort of like if someone would pull a strip of film in a

loop outside your door as you looked through the peephole. It was on a Kinetoscope people could see the first film to be granted a U.S. copyright as an identifiable motion picture—the immensely popular 1894 black-and-white, silent documentary called *Fred Ott's Sneeze*, which lasted eight seconds and was, as its title suggests, Fred Ott, an employee at Thomas Edison's laboratory, sneezing.

The piece that followed *Slow Motion* was *Scene II* installed in 2014 at Stockholm Contemporary, a project space run by Andreas Brändström in the office Britton Britton. It was a different kind of experiment than the first one. In a single room Geschwind had created two sceneries by duplicating objects: a chair, table, trashcan and other sort of office-y things, and setting them up as mirror images with slight differences. Oscillating flashes were installed to light each set-up, which generated the appearance of a shaking room. That is to say, rather than encircling the viewer, the piece was two "images" shifting back and forth rapidly so as to make up a stereoscopic effect that created the sensation of surface and depth and an animation between the two office settings.

Scene II is equally challenging to describe as *Slow Motion* and it has no clear-cut precedent. It's like two film frames going back and forth, looped, like a GIF-animation, but, again, in real 3D. This means, of course, that contrary to *Slow Motion*, which was only a sequence that went round and round, *Scene II* was one in time, since the narration went continuously back and forth.

For someone like me who gets carsick, seasick and all other kinds of motion-induced-sicknesses, and who is additionally terrified of earthquakes, which

this piece mimics perfectly, it was altogether a really tough experience. Something about this installation made it seem more seamless than *Slow Motion*, and therefore "easier" to grasp but at the same time "harder" to look at. When I asked Geschwind about it, he explained that it was with this installment that he realized the importance of a brief period of darkness in between the flashing lights. What the darkness did was to make use of an afterimage, which is the image that lingers on a person's retina of what they just saw, an imprint that stays on for a little while so as to smooth the transition to the next thing seen. Geschwind had experimented and realized that 67% dark in between the two flashes was the optimal amount for this installment, which is what made for the smooth and terrifyingly distressing oscillation. (For the sake of being pedagogical I must point out that the ratio is variable. The 67% is in relation to the speed of the animation—the flashes of light—and the quicker the animation, the longer the period of dark would have to be to allow the afterimage to fade away).

The illusion of continuous motion is called apparent motion, which distinguishes it from "real" motion. When Fred Ott sneezes on film he's in apparent motion. A person on the bus that sneezes does so in real motion. Geschwind's works take place in the realm of apparent motion. That is, it *seems* as if things are moving. When it comes to apparent motion, as with real motion, there's a lot going on. It hinges on key bits and pieces that if removed would make it not an illusion. Which is to say, an apparent motion illusion is an apparent motion illusion only when it's at work, that is, when it is illusionary. When it isn't, it's something entirely different.

In trying to better understand Geschwind's work I'm inclined to consider it when it's off, when it's not doing what it does, that is, when it is not making its illusion. Because if illusions are instances where we visually perceive something as it *isn't* in reality, when this or that *seems* to be the case, then perhaps looking at what it "really" is gets us closer to it. Perhaps it is only then that we get a point of reference from which to understand what it actually is and we might manage to uncover the distortion of the senses that it causes, which might hint at how the brain typically arranges and understands sensory stimulation. But what it is when it's off is not the work itself. And so it might come off as unusual to talk about it as such, since a viewer will never see this part. But I'm not entirely sure what all this is anyway. I'm confused about apparent motion and how it works and what it does to me. I'm puzzled over Geschwind's work, what it is that I've witnessed and what it is that I remember of the experience. It is bewildering to think about illusions, as if it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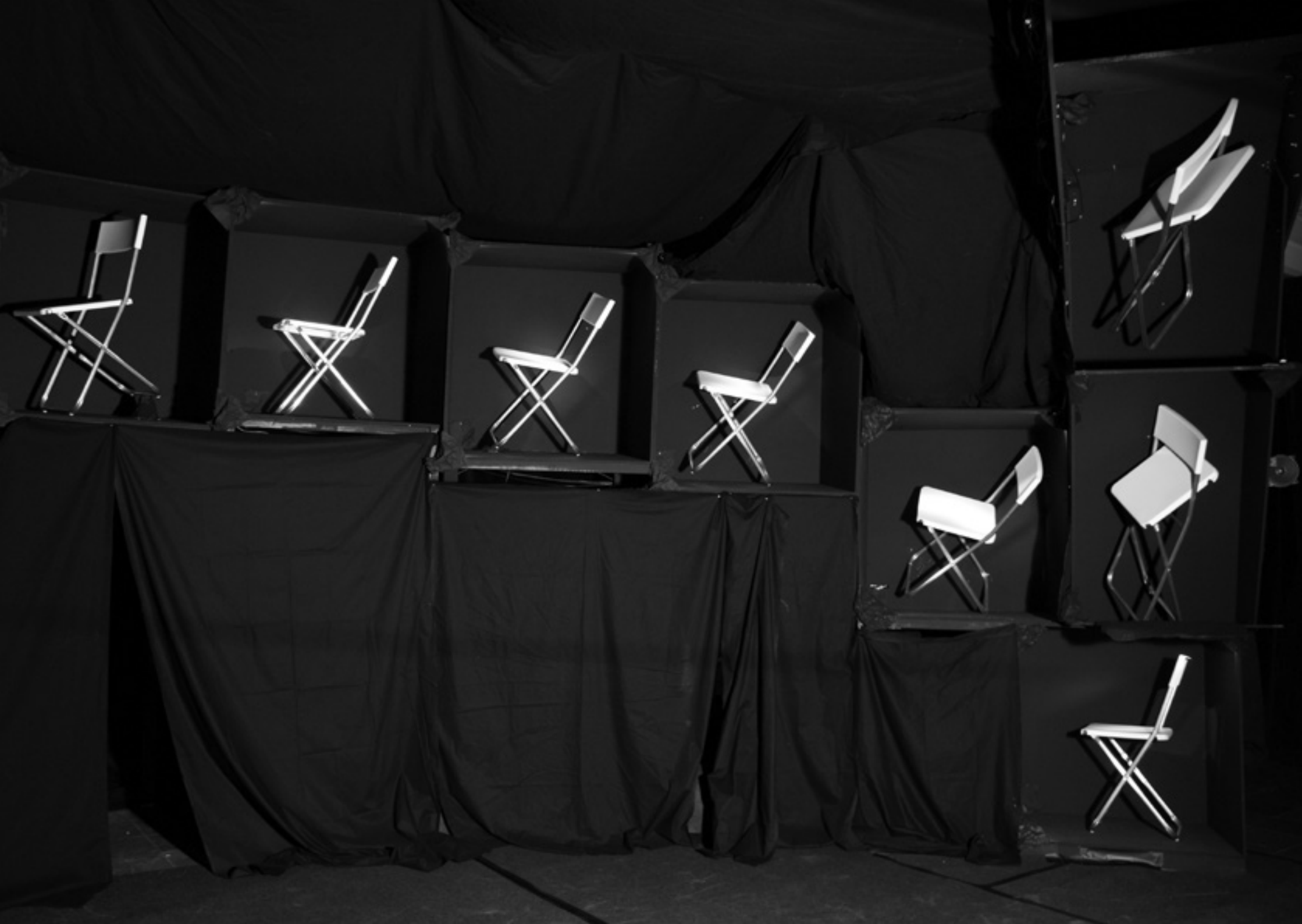
wasn't bemusing enough to think about art. And if it seems sometimes that art happens in a sort of odd interstice, and that optical illusions take place in a strange in-between place, too, then the meeting of these two off-sites becomes particularly perplexing. And so perhaps by looking at what we think that it isn't, we can get closer to understanding what we think that it is.

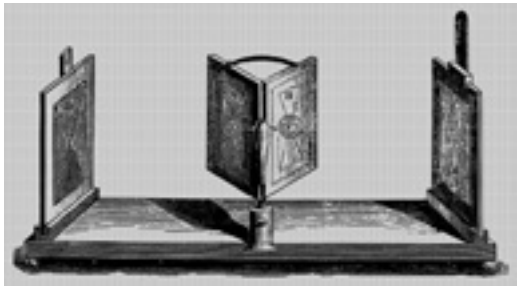
Seeing *Slow Motion* off is like peaking behind the wizardry curtain. It reveals its mechanics or, if you will, the deus ex machina that makes up the marvelous. 32 black boxes each hold one chair, and you see that the chairs are static and that they are in fact posed to make up an *idea* of movement. With a little bit of imagination you can even "see" it in your mind's eye. But you also see all the wires to the lights and the speakers. You realize that the sounds that had seemed so natural, so ordinary, as if the twirling chair actually made those little clicks on its own, are indeed pretend. You see that it's actually car stereo speakers, and following the wires that they are connected to the lights. It's not hard to then surmise that the speakers and lights run on the same little burst of electricity and that the clicks and the flashes of light are intimately related; that they are the same actually, and that what it makes up is a super-surround sound, with 32 speakers, though, like everything in here, entirely analog, "real"

sound. And more than that, you understand that not only are you falling for the trick and following the chair round and round only because you see it, but also because you instinctively follow the sound. Your experience of the world is all of your senses intimately linked together.

It's all very unmoving, contrary to what you know it can do. What effect does it have to see it like this? What happens happen when you start it up again. When you, so to speak, turn the work of art on. Because then, even though you know exactly what it "really" is, that it's "just" chairs in boxes with light and sound programmed, you still see the illusion. And this is terrifyingly significant because with it you realize that just as there is, sadly, no escape from reality, there is no escape from the illusionary.



There is an uninterrupted history of optical illusions for the reason that we, humans, are wired in a particular way. In the respect of how we physically see the world, not much is thought to have changed from Lascaux to now, and not much it seems will change. Consequently, an inherent problem in the type of studies that deal with the way we see the world is that progress in the field is to understand that we can understand that we see things in a particular manner but we can never actually *see* things differently. That is to say, anyone studying any type of illusion, no matter the headway in understanding why it appears in this or that way will continuously see it as such. We are no less amazed by Sir Charles Wheatstone's stereoscope now as in 1838 when he invented it.



What these experiences do, however, is to slightly alter the manner in which we are in the world, meaning that while the hardware of sight might not significantly change and we will all pretty much always see the same way, being *with* the world can, thanks to technical innovation, shift radically. A quite obvious and today ubiquitous example is the satellite image. Though not strictly an illusion it is no less extraordinary and for that matter completely unthinkable until recently. Just, for a second, imagine step by step what needed to happen for people to have access to the God's-eye view, as it's called. And then imagine what it might mean for a person to actually have God's-eye view.

A similar world-view-altering technical advancement was the train. The difference being that us humans' old tired hardware could get into the train car and come face to face with a situation, a circumstance, completely new so that it could hardly be re-presented, which is perhaps why Turner kept painting it.

In many ways this is what *Slow Motion* taps into. It is a part of the history of how things appear to humans and therefore to try to understand it is partly to ask how things could look differently. When scientists ask this question, *how could things look differently*, they turn towards other species. For example, while we see anything about 16 frames per second as motion, for a pigeon that would be a tediously slow slideshow. But it is in fact color, of all things, that is most referenced by scientists. I guess

because it is there that significant and measurable degrees of differences lay.

Human eyes are trichromatic, which means that we have three-color receptors in our eyes, *cones* as they are often called, that are sensitive to light of different wavelengths. What this means is that looking at a rainbow people see 7 colors; red, orange, yellow, green, blue, indigo and violet. A dog, having only two cones, would see a rainbow as blue and green with a little bit of yellow and nothing more. For the dog, unfortunately, the rainbow is less thick. A sparrow's rainbow, having ultra-violet vision, would start before the humans' with ultra-violet, violet, blue, greens, yellows, oranges, reds, and an extreme red that people aren't capable of seeing. The rainbow, for them, would start sooner and end later. Finally, mantis shrimp has sixteen cones, and see colors we aren't even close to having names for. The rainbow, if they could see it, considering they live underwater, would for them be immense, far beyond what we can imagine seeing.[i]

All this is to say that people are, at best, mediocre. Peggy Phelan, in the book *Unmarked, the politics of performance*, astutely notes that "Vision cannot be a guarantee of knowing once one knows that vision is never complete…Unable to perceive the full range of color inherent in light, the human eye is physiologically falsifying." A conclusion Phelan draws is "The camera modeled on the human eye reproduces the (flawed) sight of the eye."[ii]

The flawed way we see is what Muybridge played with, and what Walter Benjamin termed the "optical unconscious," that which the eye must have seen but which the conscious brain cannot discern or grasp due to size, motion, or inconspicuousness. In the case of Muybridge, the camera records and freezes moments otherwise unavailable to us, enabling us to see what the human optical system cannot distinguish or abstract from its surroundings or the flow of movement. All by ourselves we cannot capture the minute movements of a horse, to discern what precipitated these photographic experiments, if its legs lift off the ground or not.

So, too, but differently does that scene in *The Matrix* play with us. Not, though, in terms of things we fail to see but rather things we might fantasize of being able to see. It lets us pretend that we can in slow motion hover above something. It allows us for a brief moment to really *see*, beyond our limited natural abilities. And one can perhaps claim that particular moment in the film entertains two fantasies at once; the obvious one is being able to dodge bullets like Neo, the other is to be able to see just like the camera does.

Both these moments are geared toward extending the subject's abilities of sight by inventing techniques of capturing and reproducing things in a way that we otherwise can't. Yet, both instances are dependent on cameras. So how does it square with Phelan's assertion that the camera produces a copy of the imperfect human vision? Perhaps it's not about the reproducing device per se but rather about what the reproducing device produces. That is to say, maybe one needs to extend the notion of the camera to its ultimate conclusion, which is to its two-dimensionality—because what is an image if not something two-dimensional? What we're thinking about could therefore be the curious transference from what has form to what is flat. And it might then be that it isn't so much the camera and by extension the image that reproduces the falsifying eye but rather flatness that stands in stark contrast to all the world's shapes. This is perhaps why we're so enchanted when Sir Charles Wheatstone's stereoscope transforms flatness into depth and solidity, and why Geschwind's installations are so mind-fucking, since they manage to turn what is otherwise always flat into a new kind of three-dimensionality.

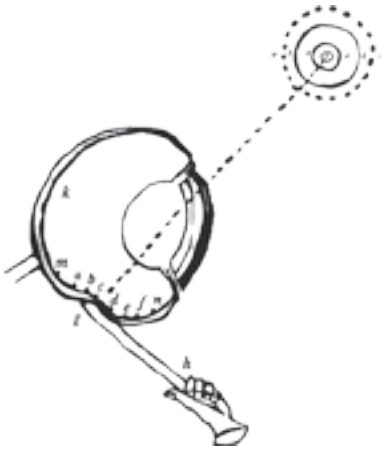
Why no one else has previously or is currently also constructing apparent movement like Geschwind is because it is, in a way, completely useless. The history of optical experiments and optical illusions is also a history of a particular market; whether it be early machines taken from town to town by travelers and exhibited for a fee or the Kinetoscope, a machine with tremendous economical value, considering that it was fairly easy to reproduce. From the very first machine the Kinetoscope was set up in commercial establishments. In 1894 it would cost you 25 cents to see the 8-second-long *Fred Ott's Sneeze* at the first Kinetoscope parlor in New York (on 1155 Broadway, on the corner of 27th Street). It's the equivalent of today paying 6.63 USD to see the also 8-second-long *Slow Motion*.

Geschwind's installations are severely limited in this way. They are completely immobile and cannot be easily reproduced. Ours is a time of neoliberal usefulness, of what is marketable and competitive, and this type of apparent motion has no weight in the marketplace. Posing the work *against* the market-

able, easily transported and reproducible projected image, the work rejects the camera and thus also the surface onto which Muybridge, The Wachowskis (who made *The Matrix*) and everyone else is forced to pin their sequences. Rather, Geschwind's installations turn these relations inside out, effectively replacing the camera with the objects and placing the onlooker in the middle. Nothing is being flatly reproduced, but something is definitely being rendered much in the same way that no politics are being stated but, by the mere action, are being enacted.

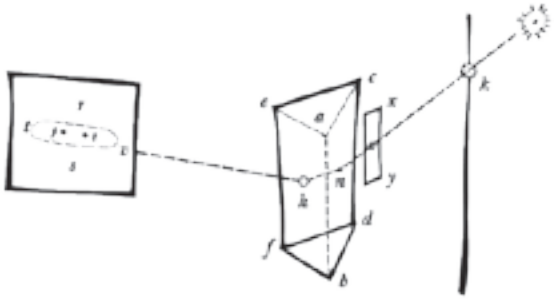
When Isaac Newton was 23, in 1665, he asks himself the question: *What are colors?* Out of this question he conducts two experiments. Number one is an experiment to put pressure on the eye by poking it with a blunt knife called bodkin. In the manuscript *Of Colours* it reads:

> I tooke a bodkin & put it betwixt my eye & the bone as neare to the Backside of my eye as I could: & pressing my eye with the end of it (soe as to make the curvature in my eye) there appeared severall white darke & coloured circles. Which circles were plainest when I continued to rub my eye with the point of the bodkin, but if I held my eye & the bodkin still, though I continued to presse my eye with it yet the circles would grow faint & often disappeare untill I renewed them by moving my eye or the bodkin.[iii]



Newton tries this poking experiment both in a light room and a dark room and discovers that in a light room a dark circle appears, whilst in a dark room the same circle appears however reddish. Indeed interesting, but not really elucidating what colors were, the other experiment yielded more definite results. Newton draws the blinds to his room and pierces a hole that lets a sliver of a ray of light shine in. In front of this ray he puts a prism. What happens is that the white light of the sun refracts into all the ingredients it is made up of. That is to say,

what Newton sees is a mini rainbow (the one he is capable of seeing). But this rainbow wasn't his discovery. People before Newton had figured out that prisms showed color. However, it was thought that the prism itself was what generated the colors. So what Newton did was to get a second prism, and place it in the field of the blue light of the first prism. If prisms added or generated color, what would happen in the blue light? Nothing happened, which made Newton surmise that the rainbow in his room was the components of the white light, and that the light itself was made up of these colors, not the other way around. Light, then, became a thing of the world.



The theory that called to question Newton's came from Goethe. Walking in a garden a day in April with Eugène Delacroix, Goethe looked at the blooming yellow crocuses only to turn his eyes to the ground and see violet spots.[iv] The marks in violet, the negative color of yellow, seemed just as real. Yet he knew that they weren't part of objective reality but came from his mind. This made him believe that perhaps the perception of color wasn't only a question of what was *out there* but that seeing color began in the world but finished inside the mind.

In relation to Geschwind's work, it is here that we stop speaking of color and begin to speak of the retina and perception. What Goethe sees is violet indeed, and it comes close to what happens to Newton when he pokes himself in the eye, but it is also a sort of the prior mentioned afterimage, an image that persists in one's vision after the "original" image has ceased. Goethe continued his interest in optical experiences made by the eye alone. As Jonathan Crary showed in *Techniques of the Observer*, Goethe used the darkroom of the camera obscura to see in the dark, that is, to see what occurs before the eye in darkness; to see what "seeing" was only for the eye. Goethe writes about the experience, and particularly about a red spot he sees that, "After a time this red, increasing towards the center, covers the whole circle, and at last the bright central point. No sooner, however, is the whole circle red than the edge begins to be blue, and the blue gradually encroaches inwards on the

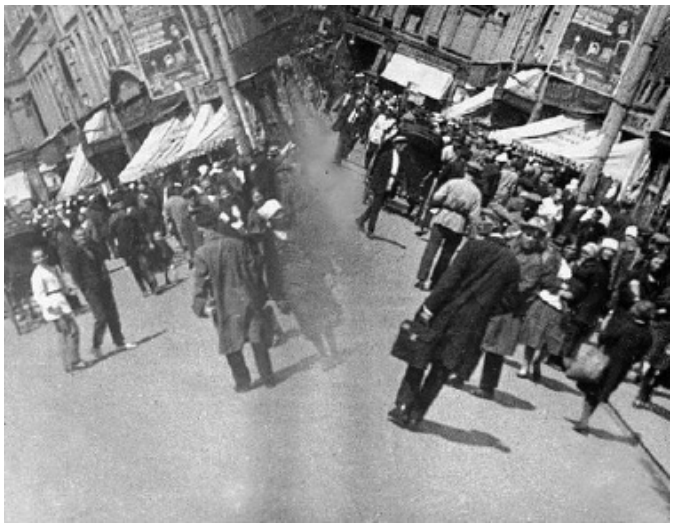
red. When the whole is blue, the edge becomes dark and colorless. The darker edge again slowly encroaches the blue till the whole circle appears colorless."[v]

Why this is significant is because of the afterimage. As Crary states in the same essay, "the retinal afterimage is perhaps the most important optical phenomenon discussed by Goethe in his chapter on 'Physiological Colors' in his *Color Theory*."[vi] And Crary's description is unparalleled as he unravels Goethe's take on the afterimage as something that engendered ideas of "sensory perception cut from any necessary link with an external referent."[vii] But the afterimage isn't only remarkable for this reason, for being distinguishable from an objective reality, but also because it has a touch of time to it. It occurs only after sight and yet it is sight, and temporality of sight becomes then the feature of the human experience. What is seen isn't necessarily always immediately in front of the subject as it's seen. The 67% dark in between the two flashes in *Scene II* hinges on what lingers on the retina. The dark is there precisely to make up the space for the afterimage, and so one never really sees it, but rather, one could say, senses it.

The role of the afterimage and the technical ingenuity to master it in *Scene II* brings Geschwind to what will be the third installment, which aims at animating the still image. So far in his study of physical animation, Geschwind has had all constituents move. But what if one object, one ingredient say, of a scene, lay still while all other pieces around it shifted and moved. Like a glitch, the movement around what is motionless will perhaps cause the unmoving to be more still than usual but at the same time more moving than ordinary. It will perhaps enter another inside-out sliver of an interstice within an already in-between, which is to say, another mind-fuck.

Geschwind has described *Slow Motion* and *Scene II* as the first scenes in an imaginary film set outside of time and space and this third, yet to be realized, installment would be one more move toward this imagined feature length large-scale animation. A film with reference to Andrei Tarkovsky and *Sculpting in Time*, which was Tarkovsky's own name for his style of film making and which he summed up quite nicely in one sentence: "The dominant, all-powerful factor of the film image is rhythm, expressing the course of time within the frame."[viii] Yet another reference in this respect might be Vertov. Because it all comes in the end to be a bit like Vertov's series of experiments that resulted in the compound of camera effects he came to call *Man with a Movie Camera*. That is to say, the exploration of the technical possibilities compiled becomes the work itself. And

just like Vertov's film, Geschwind's series can end up going *anywhere* but like color, like the afterimage, or like apparent movement, they are unquestionably part of the world, but concluded somehow inside the subject. • TR



[i] A great debt is owed Radiolab's excellent episode on color for this description. Radiolab, season 10, episode 13.
[ii] Peggy Phelan, *Unmarked, the politics of performance*, London and New York, Routledge,1993, p.14.
[iii] Isaac Newton, *Of Colours*, Cambridge University Library, Cambridge, UK. pp. 1-22. Published online: October 2003.
[iv] Ed. Joshua Charles Taylor, *Nineteenth-century Theories of Art*, University of California Press, 1987.
[v] Jonathan Crary, *Techniques of the Observer*, October, Vol 45 (Summer, 1988, pp. 3-35.
[vi] ibid
[vii] ibid
[viii] Andrei Tarkovsky, *Sculpting in Time*, p113.

Images in order of appearance

1. Eadweard Muybridge, *Animal Locomotion*, from Plate 624, 1887.

2. *The Matrix*, 1999. Directed by The Wachowskis—green screen making of "time slice" scene.

3. Eadweard Muybridge's photo shed containing 24 cameras, 1878.

4. Eadweard Muybridge, Zoopraxiscope disc, date unknown.

5. *Fred Ott's Sneeze* (also known as *Edison Kinetoscopic Record of a Sneeze*), released January 9, 1894. Directed by William K.L. Dickson. Produced by William K.L Dickson. Starring Fred Ott. Distributed by Edison Manufacturing Company.

6. Peter Geschwind, *Slow Motion, Scene II*, 2014. View of the construction, Stockholm Contemporary, Britton Britton. Photo: Stefan Andersson

7. Peter Geschwind, *Slow Motion, Scene II*, 2014. View of the construction, Stockholm Contemporary, Britton Britton. Photo: Stefan Andersson

8. Peter Geschwind, *Slow Motion, Physical animation with light*, 2011. View of the animation construction in the room, Gävle Konstcentrum, Sweden. Photo: Maja-Lena Johansson

9. Charles Wheatstone mirror stereoscope, illustration, date unknown.

10. Peter Geschwind, *Slow Motion, Physical animation with light*, 2011. View of the animation construction in the room, Gävle Konstcentrum, Sweden. Photo: Maja-Lena Johansson

11. *The Matrix*, 1999. Directed by The Wachowskis.

12. Isaac Newton, illustration from *Of Colours*, MS Add. 3975, pp. 1-22, Cambridge University Library, Cambridge, UK, published online October 2003.

13. Isaac Newton, illustration from *Of Colours*, MS Add. 3975, pp. 1-22, Cambridge University Library, Cambridge, UK, published online October 2003.

14. Still from Dziga Vertov's *Man with a Movie Camera*, 1929.

15. Peter Geschwind, *Slow Motion, Physical animation with light*, 2011. View of the animation construction in the room, Gävle Konstcentrum, Sweden. Photo: Maja-Lena Johansson

Colophon

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