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DECOMPOSITION OF MOVEMENT AND THE PHOTOGRAM; the Conception of the Photogram in the Work of Marey, Vertov, Eisenstein and Godard.



I will here argue that decomposition of movement, principally in the cinema of Jean-Luc Godard and Dziga Vertov, is used as a means of investigating the image in different respects. The technique may focus on the role of the photogram, and invoke affinities between the film and processes of thought. Thus, decomposition foregrounds a problem central to any film theory, namely the problem of dualism between perception and consciousness in film viewing. This does not apply to all instances of decomposition of movement, and to narrow the thesis in scope I will take a couple of films by Jean-Luc Godard from the late 70s and early 80s as an example. Since his work often relates to the beginnings of cinema, a look back to the invention of chronophotography is useful, as is a sketch of the role of the photogram in the different conceptions of Soviet montage during the 1920s. The innovations by Etienne Jules Marey and the films and writings of Sergei Eisenstein and Dziga Vertov will be central to my argument. I will finally consider how the element of decomposition may advance an intermedial perspective on cinema through the example of the referrals to painting in *Passion* (1982) by Godard.

The film of Godard where the decomposition technique is most widely employed and later discussed is *Sauve qui peut (la vie)*, in English erroneously called *Slow Motion* or, slightly better, *Every Man for Himself*. In eighteen instances of this film the projected image is slowed down, brought to a halt, “flipped” a couple of images forward to be brought to a halt again, and so on, until the conventional movement is restarted. It must be stressed that this is done without cuts, which distinguishes it from the now common freeze-frame at the end of shots in fiction and documentary films. It should be pointed out that the projection of the film is of course carried out at normal speed and that the effect is achieved by copying identical photograms in line on the projected film strip. The amount of identical photograms following each other is relative to whether the desired effect is a discontinuous movement or a longer halt. This technique is employed when the main protagonist in the film (Nathalie Baye) is in the countryside on her bike or during a football practice. The use in sequences of sport or bodily movement is a reference to the origin of the technique. This evokes Marey’s chronophotographic studies and the study of human action in

work and sport, for instance in Vertov's *Chelovek s kino-apparatom* (*The Man with the Movie Camera*, 1929) and Leni Riefenstahl's *Olympia* (1938). Today, the technique is very common in sports programmes on television. The aim of the technique today is the analysis of a "crucial" moment in the flow of movement. As will be discussed later, this suggests a return to the "privileged moment" in painting, a synthesis of several positions in an action, which was transgressed by the experiments of Marey and Lumière. However, decomposition of movement is not motivated by any dramatic or "revelatory" considerations in Godard's work, but a means to interrogation of the nature of the audio-visual. Godard makes an explicit comment on the technique in the video "script" or companion to the film, called *Quelques remarques sur la réalisation et la production du film "Sauve qui peut (la vie)"* (1979). During one of the decomposition sequences, a video text is introduced over the image, saying "Trouver la mémoire/ + lentement" ("Finding the memory/ + slowly"). This implies that the decomposition work is concerned with functions of memory, the past. A case could also be made for it being concerned with film history.

Godard employed this technique during his video period in the mid- to the late seventies, for instance in *Six fois deux (sur et sous la communication)* (1976) and *France tour/detour - deux enfants* (1978). As he has simultaneously been working with film and video since 1979, this technique can be found both in his videographic and cinematographic work. It is clear that the mechanical devices of both mediums allow for the technique. Cinema has always employed this technique for investigating images on the editing table (in post-production or among film researchers), and video technology offers the "jog & shuttle" device to the ordinary user. One of the first extensive uses of this technique in cinema may well be attributed to René Clair's *Paris qui dort* (1924). In the most recent works by Godard, the technique is abundant, together with images of cinema editing tables winding the



Dziga Vertov, The Man with the Movie Camera

film back and forth, in video works such as *Puissance de la parole* (1988) and *Histoire(s) du cinéma, 1a + 1b* (1988). Before showing how this refers to certain points in early film history, the term decomposition demands closer attention.

Decomposition of movement is a term frequently used in French film terminology to describe the effects I have pointed out. The term implies that something coherent is broken down into its separate constituents. The decomposition of movement is the disintegration of a unity, the unity as a synthesis of movement created by the projection of the filmic image. We know that this unity is made up of different "cells", the photograms, which during projection at normal speed create the illusion of movement. Just as nitrate film, when not preserved appropriately, may disintegrate or decompose, the movement of the filmic image loses its coherence or is broken down in order to be analysed. As Raymond Bellour has noted, this use of the still image is the point of departure for an interrogatory perspective on film.¹ Speaking of painting, Eisenstein also stressed the need to break down a unity into its constituents in order to be able to make an analysis of the object, before reassembling the results of the analysis in a different order.² In cinema, the movement of the object is decomposed through the act of shooting, and reassembled in another order through

montage and projection. This process can be laid bare through a new, or second, decomposition of the movement of the image. There are affinities between the decomposition of movement and the process of analysis and investigation. The process bears very much on the idea of the study of the object. This allows for a simultaneity of presenting and interrogating, of showing and studying, of telling and asking.

The photogram and its origins

Decomposition of movement *apparently* makes the photogram visible. The status of the photogram is paradoxical as it constitutes the premise for the visual dimensions of a film, but it is never visible in its isolation. This is because of the phi-effect, which makes the separate frames “disappear” in preference of the perception of a coherent movement when the film is projected on a screen. This use of the term “photogram” is restricted compared to the common use. Originally, the term designated the single photographic imprint on a film strip. After it has come to use in cinema terminology, it has held lots of implications. For instance Laszlo Moholy-Nagy has called the filmic image created without a camera a photogram, but its traditional use is the single frame seen on the film strip.³ The term has also been used to designate printed illustrations for published texts, when this, without alteration, is culled from the film strip. Roland Barthes’ use in his classic essay “Le troisième sens” is more ambiguous, but he also terms his illustrations for the article from *Bronenosets Potemkin (Battleship Potemkin)* as photograms.⁴ One reason for this use of the term is that Barthes, as well as others who entry this debate at the same time, is more preoccupied with the signifying aspects of films than a discussion of cinematic movement.⁵ Since the single photogram is imperceptible in its isolation when the film is projected, the analysis of the “photograms” in the use of Barthes and others, refers to the film image. Instead of investigating the photogram, this approach adds up to an analysis of the image when this does not undergo changes in terms of movement inside the frame or through camera movement.

Hence, the visibilities invoked by Roland Barthes I would like to designate as film images or images. When they are printed as illustrations to his article, we deal with “frame enlargements” as long as they are culled from the film and the

ratio is the same as in the film. The single extract from the film strip, as perceived through the stop motion of an editing table or through investigating the film strip directly, we will term a “frame”. The same term should be used to designate the still photography as seen on the film strip. This creates a very restricted use of the term that we see as useful for developing the paradoxical nature related to the movement of the photogram. When the film is stopped in projection or in the editing table, or singled out on the film strip directly, it ceases to be a photogram, which requires movement in projection, and becomes a frame instead.

The paradoxical nature of the photogram is identified by Christian Metz and Thierry Kuntzel, but all choose to employ the term “photogram” in reference to the immobile image.⁶ This even leaves Jean Mitry with the problem of having to discard the photogram as a unit of movement, since movement in this terminology is extracted from the photogram.⁷ As we already have a satisfactory term for the immobile imprint, i.e. “frame”, but lack one for designating the frame in projection, “photogram” is more suited for this restricted use. In the case of a photogram or a frame shown within the image, this is of course no longer a photogram, but an image of a frame. These images are frequent in the shooting of the montage process or of the work at the editing table in the productions by Vertov and Godard. These distinctions are for definitory use only, and I will argue that the techniques referred to, literarily showing the montage process or decomposition of movement, actualize *the idea* of the photogram, even if the photogram continually “goes behind our backs”.

It is important to point out that the phi-effect is not caused solely by a retinal afterimage, but an automatically triggered “interpretation” of the different photograms as coherent movement. The phases of movement between the photograms are “induced” on the basis of the already existing extracts. The experiments with this phenomenon were widespread about the time of the birth of cinema, and the identification of the phi-effect is often attributed to Max Wertheimer, who based his experiments on light flashes with variations in spatial and temporal intervals.⁸ The perceptual mechanisms creating movement have been commented upon from the beginning of film theory, among the first were Frederick Talbot and Hugo Munsterberg.⁹ Talbot reports the effect as based on the retinal afterimage, whereas Münsterberg explains that the mere seeing of

successive points cannot account for movement, and that cinematic movement results from a mental process. Among later theorists who manage to keep their thoughts clear when it comes to cinematic movement is Jean Mitry in his *Esthétique et psychologie du cinéma II* and Christian Metz' *Langage et cinéma*, but the number of prominent film researchers who propagate the retinal afterimage fallacy is embarrassingly high.¹¹

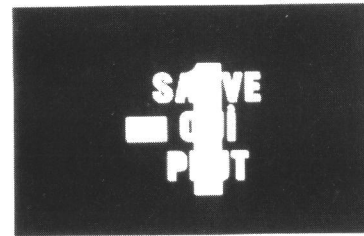
The reason why the retinal afterimage explanation is so widespread is due to the fact that the mechanisms of the perception of cinematic movement are taken for granted, and, if often reproduced, seldom discussed. It is also symptomatic of an unwillingness on the behalf of film theory to engage in the study of the basic tenets of cinematic perception. Not that this afterimage doesn't exist - it does - but it can not account for cinematographic movement. I will return to one example where it comes into play together with other perceptual mechanisms, the case of the effect of double exposure. But in accounting for movement in films, the retinal afterimage would instead result in a visual blur.

The apparatus of cinema gives the photogram a position in a coherent movement because the viewer carries out a rationalisation of the stimulus into the "most likely" solution as to what happens on the screen. The brain "perceives beyond" the separate constituents. In order to avoid this "synthetisation" in the viewing of the film, Dziga Vertov opts for the decomposition of movement. As pointed out, this is achieved by multiplying the identical photogram in line on the film strip in order to invoke a consciousness of the photogram in the viewer. This is also done by showing the montage process, where one sees the singular frames on the film strip and on the editing table. The photogram maintains its paradoxical status in this procedure; what the viewer sees is just the "illusion of immobility" as the photograms in reality pass the projector aperture at normal speed. It is simultaneously the basic visual element and invisible in its distinct form. Here it could be argued that the photogram is visible on the film strip when not projected, but this would no longer be a "filmic photogram", as projection traditionally never has been disputed as a condition for the cinematic apparatus. If the viewer stops the film in the viewing/editing table, he could alternate between the "natural" speed of the image projected and a study of the isolated photogram. This wouldn't, however, be the same principle of projection. As Jean-Luc Godard

points out in *Soft and Hard (Soft Conversation on a hard Subject between two Friends, 1984)*, what differentiates between television and cinema is that film is projected from the back onto a screen, whereas on television the light source is in front of us. The editing table, with viewing space only for one or a couple of persons, could along these lines of thought as easily be equated with the private sphere of television as with the projected image of cinema. This difference in projection is also what constitutes the difference between the technology of Edison's Company and the projector of the Lumière brothers. This elusive trait in the photogram gives it an exceptional perceptual and conceptual position that will be developed below.

If the projection of films wasn't considered to be a prerequisite to cinema, but only its shooting, Etienne Jules Marey would have been the undisputed inventor of cinema. His chronophotographic gun was eventually developed to employ the transparent celluloid film strip, which consisted of separate frames exposed to light at equidistant intervals of time thanks to a rotating shutter. This was done as early as 1888, but he never completely solved the problem of projection. His projector of 1893 lacked the claws that secure that the film strip is fed in front of the projector lamp and held still at the right fractions of time. Marey's intention was probably never to project films at "normal" speed, but to be able to show developments over time in objects that undergo very slow movements, imperceptible to the human eye, like plants and seasonal changes. If one looks to the photogram, however, Marey may be credited as the first who worked with the temporally equidistant photographic extracts of movement.¹² Our earlier discussion makes clear that our definition requires projection for the photograms to function as such, as they become frames at the moment they are immobile and distinctly visible.¹³ However, Marey's studies of movement could be seen as "virtually cinematic", as later technological advances has permitted them to be projected. If and when projected by the principle of projection developed by Lumière, Marey's work on film becomes photogrammatic. The photogram is invoked as an idea in the work of Marey, just as it is in the work of Godard through the technique of decomposition of movement.

The central difference between Eadweard Muybridge and Marey is that the former projected images already in 1882 - with the use of a projector similar to Reynaud's praxinoscope



The opening segment of Sauve Qui Peut (La Vie)

- but that these were not photographic. They were clichés transposed from the photographic images in order to be projected by the means of a plate of glass. The work of Muybridge lead Marey to make chronophotographic studies on film. Marey's goals were mainly scientific, and he devoted much time to the *study* of the temporal extracts. The revelatory aspect of Marey's work was the chronophotographic function of equidistant extracts of movement. This is no small contribution to future developments, as the experiments relate to the basic tenets of the traditional positivist, scientific ideals of the time. The photogrammatic principle means a transition from privileged poses in space and time to temporally determined ones motivated by the cinematographical apparatus. Muybridge's photographs were equidistant in spatial intervals, as the horse released the camera through its movement, but not in temporal intervals as the technology did not decide when the photographs should be taken (the movement of the horse did). This element was secured by Marey's camera shutter, and it could be claimed that it has changed the way we see the world to a much higher degree than other "pre-filmic" inventions that bears on projection but maintains the privileged poses of painting or still photography.

Dziga Vertov's photograms

In Dziga Vertov's work, one can easily find references to the work of Etienne Jules Marey. The structure of *Chelovek s kinoapparatom* is one example of this. The shooting of the film and the later scrutiny and investigation of the same film within the film, form a strategy that unites the endeavors of Marey with the ones of the man with the movie camera. Mikhail Kaufman operates the camera, upon which Elisaveta Svilova scrutinises the takes and executes the editing. The recording of a movement becomes the object of study and research in the editing table, it is suggested, something that can lead to discoveries and ideas that were not present during the shooting. The material characteristics of the film are productive by the fact that new relations and implications are created.

That projection is part of this productivity becomes clear in the structure of the film. The opening of the film shows the movie theatre, at first empty, then crowded with people. When the projectionist loads the projector, one sees that the boxes of film are labeled *Chelovek s*

kinoapparatom. Through this device, the film unrolls simultaneously for a public that is part of the film, as it does for us as "external" viewers. Subsequently, not only the shooting and post-production work is thematised, but also the projection as a collective activity and experience. This gives the work a poignant "mise-en-abyme" structure. The idea of the chronophotographic film takes shape in retrospect of the shooting of the footage. There is not a "food for thought" that is placed in the work in the form of authorial intention before the shooting, this is created and recreated through every encounter with the work.

In the writings of Eisenstein, montage is often designated as "collisions", while in Vertov's words it consists of intervals. This term emphasizes the transitions of movement in the montage. Vertov claims that

Intervals (the transitions from one movement to another) are the material, the elements of the art of movement, and by no means the movements themselves. It is they (the intervals) which draw the movement to a kinetic resolution. The organization of movement is the organization of its elements, or its intervals, into phrases. In each phrase there is a rise, a high point, and a falling off (expressed in varying degrees) of movement. A composition is made of phrases, just as a phrase is made of intervals of movement.¹⁴

The intervals between different movements are the basis for the montage in the work. The notion of the interval bears on music to a large extent. There are at least two different possible implications of the term - the quantity of movement of light within the single image, and shifts in tempo of movement through editing or within the same take. The first instance would resemble the tonal or overtone montage of Eisenstein's, and surely takes place in the work of Vertov as well. The accent seems to be on the second implication, however.¹⁵ This takes place in different ways. In a cut from one take to the other there are intervals dependant on the distance to the object in movement, which determine the time it takes for the object to move through a given distance on the screen. More specific for Vertov's work are the intervals between takes in slow, normal or fast motion. Even a "backwards" movement, by Vertov described as "the negative of time", is included in this line of work. The examples of this are abundant in the *Kinopravda* series (1922 - 1925), in *Kinoglaz* (1924) and in the later works. The technique of decomposition of movement, through halting, proceeding frame by frame, and

again speeding up the coherent movement, reaches a climax in *Chelovek s kinoapparatom*. Thus the decomposition procedure actualizes a set of questions of concern to the status of the photogram.

Marey's experiments are referred to in abundance through an emphasis on the photogram in Vertov's works. In *Chelovek s kinoapparatom* one finds decomposition of movement on several occasions. Especially relevant in relation to Marey are the sequences of the trotting horse and the study of human movement in the "sports sequences". The numerous machines that play a central part in this film often have a "cinematographical", jerky and "interruptional" movement, that leads one's thoughts to various mechanisms that play a part in cinema in general, like the perforation claw and the maltese cross. These technological innovations are conditional to the photogram. The photogram is placed in the centre of interest through certain rapid editing processes, so quick that each take only consists of a single photogram. In addition, there are animation sequences, where the animation camera requires that each photogram is shot one at a time, temporally isolated. Besides, many of Vertov's works employ flashes of black and blanks that resemble the flashes that determine the film projection. These flashes are created by introducing single black, white or grey frames among the other takes. This promotes a photogrammatical dimension within the works.

The montage sequences of takes consistent of single photograms play with the borders of our perceptual capacities, and thereby actualize the paradoxical function of the photogram. In the early parts of *Chelovek s kinoapparatom*, there are alternating montages between an eye that looks in different directions and quick pans over cityscapes.¹⁶ The gradually increasing frequency of the cuts makes the takes of the eye consist of only single photograms. However, the sequence is not deprived of an impression of movement in the eye, as the image reappears at such short intervals that the viewer directly goes on reading from the position of the eye where she or he left off in the preceding image. The same pattern characterizes the sequence with alternations between the switchboard and the packaging of cigarettes later in the film. Here, both elements gradually decrease in duration to the single photogram in each take. Different perceptual and cerebral functions situate these sequences on the verge of the double exposure. These

simulated double exposures become "triple exposures" in an alternating montage including the man with the movie camera, the textile mill and the pumping piston fragment of a machine. The final montage of this kind, depicting the film's defilement on the editing table, the editor Elisaveta Svilova and images from the life of the city, also evokes the triple exposure.

The fact that one sees the difference between these sequences and the actual double or triple exposures in the film, results in perceptual mechanisms being placed at the centre of interest. These are consistently related to the functions of the photogram. The simulated double and triple exposure sequences are, because they consist of intercut images of one or two frames, accompanied by a very present flicker. Consequently, the intervals and the distance *between* the photograms are emphasized. This is also achieved by introducing shots of the film stock or of the editing process. Following the stop motion of an image, one sees the same image with sprocket holes on a film strip. The following take shows the multiplicity of the same image on the film strip, and in an increasingly distant perspective towards the initial frame, one sees the film strip being handled in the editing process.

Vlada Petric relates these single photogram sequences to a reputed interest in subliminal psychology on the behalf of Vertov.¹⁷ This interest Petric concludes from Vertov's one term psycho-neurological studies in Petrograd in the spring of 1916.¹⁸ According to Petric, the appearance of these single photogram sequences are only identifiable through studies in an editing table. The isolated motives are not attainable for the viewer's consciousness. Instead, Vertov aims, (also according to Petric) to initiate a subliminal perception, unconsciously elaborated by the spectator.¹⁹ If this was correct, the film researcher with access to an editing table would be able to disclose these mechanisms in the work, whereas "the ordinary man at the movies" would not have the opportunity to become conscious of these processes.

However, Petric ignores one important aspect of these functions in *Chelovek s kinoapparatom*. The single photograms are identical to takes that also exist earlier or later in the film, with a longer duration. The rapid editing always consists of patterns of reappearing images, which in the single photogram sequences are repeated sufficiently often to form an impression that perceptually verges on the limit to the double exposure. This makes it unproblematic either to

perceive the image or to see what it depicts. It is not possible to estimate how many times the photogram reappears or exactly how many frames the take consists of. In order to study this, the film has to be viewed on an editing table, but the perception of the image is never problematic. Thereby the argument of Petric concerning the subliminal psychology is considerably weakened. An additional problem with Petric's argument is that he identifies the "phi-effect" as a product of a retinal afterimage.²⁰ If this was to lead to a subliminal "propulsion", the functions that decide which information is to reach the consciousness and which is to be "stored" in the unconscious, must consequently be situated in the retina.²¹ These are necessarily cerebral functions.

The brain "induces movement" in the "empty spaces" in the line of projected photograms, because this is the easiest way to make the information meaningful in the given context. The retinal "delay" may play some part in the function of the described double exposures, which is the primary concern for Petric's evocation of the phi effect. It is more likely, however, that the decisive part in the superimposition effect lies with the same faculties as the "adding" of movement to lines of photograms constituting a shot. The brain's need to simplify the information that is induced through the rapidly changing images makes us conceive these repetitious alternations as a single superimposition. This gives the viewer one relatively stable situation to deal with, instead of a situation that changes up to ten times a second. Hence, the effect so often attributed to the retinal afterimage, is better explained as a result of functions in the brain, than as a "direct" and purely retinal effect. It is likely that the illusion of double exposure is due to a *seemingly* delayed visual perception, because it is useful (i.e. meaningful) to the comprehension of the image. Consequently, the effect may be an *illusion* of a retinal afterimage, induced by the brain. It should be noted that the single photogram sequences are central to the field of study singled out by Petric in his book. This should focus not on subliminal perception, but on how the investigation of the phi effect in the film leads to a problematisation of the reigning dualism between perception and consciousness. Instead, Petric's identification of a subliminal propulsion is argued in a way that serves to situate the work of Vertov within this duality.

The photogram is in Vertov's work the "matter

of movement", and consequently central to the interval. The intervals have a perceptual dimension of thought. The photograms are in the case of Vertov's work the link to the "matière grise", which is Marcel Duchamp's expression for the mental and conceptual dimension in the painting. In the written, theoretical work of Sergei Eisenstein the photograms are often given a representational and secondary position, because movement and "the total image" is the level connected to the mental dimension. The work of Vertov positions the photogram as the germ of the mental activity. This implies that the primary position of the photogram assures that perception and thinking is one and the same process. Eisenstein's division between the retinal and the mental dimensions results in different material conditions for perception and consciousness, respectively.

Eisenstein's theory of the photogram

The writings of Eisenstein do not, at first sight, give a central position to the photogram. Often, the photogram is given a representational function (*izobrazhenie*), which, especially in the later texts, is regarded as subordinate to the "total image" (*obraz*) and movement. Comments on the function of the photogram can be found, however, in several of his texts on the concept of montage in general. In "Montage 1937" he touches on the subject specifically when he describes the illusion of movement as the fundamental problem of film.²² He points out that the juxtaposition of two static images results in a concept of movement. He expands on this, however, to point out that "mechanically" this description is insufficient. Each sequential element is actually positioned, not side by side, but on top of each other. A number of "immobilities" following each other is for this reason really a kind of double exposure. When Eisenstein calls this a mechanical function, he conceives of it as a mechanism of perception. A very telling example is to be found in *Oktiabr (October, 1928)*, where extremely brief images of a young bolshevik aiming a machine gun alternate with equally brief close-ups of the muzzle of a machine gun. This not only produces the concept of shooting and introduces a dimension of sound through the rhythm of the machine gun in this silent film, but also borders on the double exposure.



“The Virgin of the Immaculate Conception,” *after El Greco, in Passion*

The governing principle of this sequence forms the basis for large parts of Eisenstein’s theories of montage, where each element is not linked to the surrounding ones, but acts on each other as a form of “collisions”. This theory is implicitly based, among other principles, on the phi effect, and is as such connected to the photogram. It should be noted, however, that it is not the photogram, but the “immobile” image that he describes. The photogram only exists in its plural realisation when projected in a sequence.²³ Eisenstein here discusses the juxtaposition of different images or shots that lack movement in its conventional sense. But these images consist of a line of photograms that resemble each other, so it would for this reason not be correct to claim that they have had their movement extracted.

In the opening of “Laocoön”, Eisenstein emphasizes that all cinema is montage cinema, and that “the most fundamental cinematic phenomenon - the fact that the picture moves - is a montage phenomenon.”²⁴ This causes him to single out both a micro-montage and a macro-montage. These terms refer to the juxtaposition of photograms in the cinematographical technology and to the structuring of the parts of a whole film, respectively. As an example, the original plan for *Que Viva Mexico!* (1931), where different temporal layers in the geography and history of Mexico should form the structure of the film as a whole, would be a macro-montage.

In this context, the juxtaposition of photograms through micro-montage resulting in movement, is the most interesting. By pointing out the element of montage in each frame’s juxtaposition to the preceding and the following ones, Eisenstein emphasizes the constructed character of this relation resulting in movement. This way the distance, or the interval, between the photograms is underlined in order to transgress the conventional illusion of movement that the film is often related to.

This starting point for a discussion of the function of the photogram is placed within a mechanical double exposure. As in Eisenstein’s view of montage sequences, the single photograms act on top of each other. This explanation of the movement of the film could be seen as a “persistence on the retina” position, instead of a cerebral “adding of movement” to the stimulus a posteriori. Even if Eisenstein applies movement to the functions of the brain, he tends to relate it to a “persistence” of consciousness. He claims that “...the principle of cinema is no more than a reflection, [...], of an inevitable and absolutely basic psychological process that is common to each individual consciousness from its first steps in the absorption of reality. I refer to what is called eidetics. [...] Without eidetics, we would never be able to reduce all those ‘split-second photographs’ of the separate aspects of phenomena into a single image.”²⁵ In this

passage, Eisenstein locates movement in the consciousness, but keeps to an idea of a synthesization of separate aspects into a single image that favours a “perceptual delay” model of explanation for cinematic movement. The explanation implies a duality between the “mental” or “total image” on the one hand, and the “separate aspects”, the frames of representation, on the other.

The construction of movement is not caused by a “double exposure” effect or a perceptual delay of each photogram. Eisenstein’s explanation is symptomatic for an aim in his cinematic work at transgressing the materially retinal reconstitution of movement through projection. One reason for the division between the retinal and the mental is his identification of movement as caused by an afterimage, whether it is cerebral or retinal. To overcome the alleged “automatism” in the cinematic movement, his films are marked by temporal manipulations through cuts, repetitions and disruptive spatial constructions. The endeavor to overcome the illusion of spatial continuity especially marks the earlier works. A reciprocal independence between the different photograms is underlined through this principle, and results in an attenuation of the role of the interval as *opposed* to the retinal.

François Albera sees this critique of the retinal as a symptom of an ambivalence underlying the whole of the theoretical work of Eisenstein.²⁶ On the one hand there are the principles of the montage of attractions, which presuppose heterogeneity and a rupture between the different elements in the sequence. These principles bear on the photogram as a visual extract of a coherent movement, that constitutes the representational level in the film. On the other hand there is the “totality of movement”, the total image, which is more of a purely mental than a visual dimension. This level in Eisenstein’s theory is related to a Hegelian idea where difference and contradiction are aspects of a whole, being presupposed in each of its parts; the idea of the part for the whole, *pars pro toto*. Eisenstein’s account for cinematic movement is rather original in that it reconciles parts of the “retinal afterimage” view with a theory of a mental rationalisation that results in movement. This position between the “physiological” and “psychological” explanations could be seen as an indication of the ambivalence towards the photogram pointed out by Albera. Albera also points out that the alleged “turning point” in Eisenstein’s filmic and theoretical work which occurred about 1930, discussed as such by David

Bordwell,²⁷ among others, is due to an ambiguous property of all of his cinematic and theoretical work, before as well as after this time.

Albera’s example of how Eisenstein comments on the role of photogram in his filmic work is the sequence in *Oktiabr* where Kerensky mounts the stairs. In this sequence, the repetition of photograms from the same shot are intercut with other shots. This overlapping technique emphasizes the constructed nature of movement conditioned by the phi effect, and functions as a demonstration of the “bricks” of the moving image. The parallel lines and the equidistant intervals between the stairs form an analogy to the film strip. The overlapping time span in different takes underlines Eisenstein’s position. The visual or the retinal in itself only consists of representations in the shape of photograms, while the movement and the repetition has a mental character. This distinction has at its foundation the dualism between perception and consciousness.

According to Albera, this position is in part a defense against criticism against himself and Vertov made by Malevich in 1925.²⁸ Malevich states that the two film directors employ a new technology to continue an obsolete tradition in easel painting.²⁹ The two tendencies in the theoretical work of Eisenstein, the montage of attractions and *pars pro toto*, reflect an opposition between the retinal and the mental in his line of argument. Eisenstein feels that he has left the retinal limitations of cinema and works within a mental dimension, which is based on the “totality” of movement, the “intervals” and the wholeness of the work. Eisenstein’s criticism of the retinal shows similarities to Marcel Duchamp’s conceptions of the same phenomena: “...la peinture ne doit pas être exclusivement visuelle ou rétinienne. Elle doit intéresser aussi la matière grise, notre appétit de compréhension”.³⁰ It is revealing that Duchamp shares an interest in the repetition and the intervals of stairs of the Kerensky sequence of *Oktiabr* in his painting *Nue descendant un escalier (Nude descending a staircase)* of 1913. Duchamp has shown interest in chronophotography, and pointed out that the work of Marey and Muybridge was of great importance to this specific work.³¹ Affinities with Muybridge’s zoopraxiscope, a rotating plate of glass with clichés painted on it, could also be found in Duchamp’s glass paintings, for instance *La mariée mise à nu par ses célibataires, même*.

In the work of Eisenstein, a reference can be traced to the work of Muybridge rather than to

Marey. The mechanism of the zoopraxiscope of Muybridge, adapted from Reynaud's praxinoscope, continually repeats the same line of movement.³² This is what actually happens in the Kerensky sequence, and is revealed as an illusion since there is no logical reason why Kerensky should be overlapping his movement up the stairs, whereas for example the horse of Muybridge was beginning another step in its gallop and made the repetition seem logical. The interest in a repetitious sequence of stairs of this kind can also be found in Muybridge's study of a woman with a bucket of water mounting and descending stairs, as well as among others who take an interest in the relation between cinema and painting. Ferdinand Léger has a cleaning woman mount the same stairs nine times in a row in *Ballet mécanique* (1924), and Maya Deren shows a preoccupation with the same technique in *Meshes of the Afternoon* (1943).

The photogram has a function exceeding the conventional in the work of Eisenstein. The critique of the retinal makes the discontinuous, the space between the photograms, the central element. Consequently, matter, the object, is for Eisenstein passive, and must be made dynamic externally, from a conscious initiative. This implies an emphasis on the "grey matter", a mental dimension between the photograms or between the images. This is the basis for a dualism between the retinal and the mental in the work of Eisenstein. The reason for this dichotomy is to be found in his identification of cinematic movement as a retainment of the image in the brain, whereas it is caused by a rationalisation of extracts into a coherent movement. In several contexts the difference in results between these two perspectives with regards to the phi effect would be minor, since visual information is received and elaborated in the brain. In this case, however, the difference is vital. The status of the photogram is fundamentally altered by the development of knowledge of the phi effect as an "induction" of movement on the basis of the given stimuli, instead of being a product of a persistence of an image. The photogram can thus shed light on a dualism rooted in the philosophy of mind between consciousness and the other properties of the brain. One of the major material achievements of the development of chronophotography and cinema is their capacity to question this dualism. This is also the reason why a theory of the photogram, implicitly or explicitly, holds a central position in the work of

Dziga Vertov or in Jean-Luc Godard's work since the mid-seventies.

Film as intermediation and a process of thought

We have already discussed how Eisenstein's filmic and written work tends towards a dualism between the visual and the mental, where the later dimension is given priority. This makes the material properties and the filmed objects passive, and presupposes an external initiative to obtain a meaning and a dynamic function.³³ The consciousness has to "animate" the objects and the images. This duality is the same as the one that patterns the conception of editing in the films. The creative "source" in the cinema of Vertov lies in the process of study that follows the shooting. This is the reason why the editing table, in its presence as an object in the film, is given such a central role in his works. In the editing process one stops the movement of the film, examines juxtapositions and relations and receives new ideas. This procedure motivates an attribution of Picasso's famous words to the credo of Vertov: "D'abord je trouve, puis je cherche".³⁴ In Eisenstein's work, there is an idea or a pattern of thinking, an intention, pre-existing the shooting process, which through the whole production process makes the "content" dynamic. This dualism basically takes its place between the perception and consciousness. Perception is related to the retinal, while the mental dimension of the film could only originate through an external force.

Both Eisenstein and Vertov take an interest in processes of thought and the cerebral capacities of cinema. While there are for the former techniques that can mediate the idea from the planning process through shooting to post-production and projection, the set of ideas of the work are for the latter a product of the very montage of the film. They come into existence in the intervals themselves. This difference is a product of two distinctive conceptions of the status of the photogram and its function in the film. The deconstruction that characterises all analysis is for Vertov identical to the decomposition of movement necessary to attain an investigation of the role of the photogram. Also Eisenstein's work is receptive to a dynamic and changing element in the historical and social context of the film. The film carries a number of potential significations that are ready to

“explode” in new contexts. This property of the work is, however, an indication of how the potential significations are already invested in the work by an intentional force from outside, and do not emanate from the montage or juxtaposition in itself. Eisenstein explains the position: “Finally, the image, which in my view is constituted as a generalization, as an aggregation of separate metaphors into a single whole: this is again not a process of formation; it is an end-product, but an end-product which, as it were, contains a swarm of *potential* dynamic (metaphoric) features that are ready to explode”.³⁵ Eisenstein makes his estimations before the shooting, and his analyses of his films in the written work afterwards. The many sketches from the planning process and all the sharp-eyed analyses of his own work bear witness that there is an intention external to the work that animates the “mental” dimension. The duality between perception and consciousness, or intention, in the case of Eisenstein, is contrasted by a coalescence of these dimensions in the work of Vertov. The distinction between idea and image, hence between consciousness and perception, is erased in this aesthetic.

Painting as a Photogrammatical Element

Among various montage strategies, the image tracks can be marked by a differentiating principle, where ruptures and cracks dominate both the horizontal and vertical montage. One technique would be to single out painting as an element that constitutes a separate level in the work. Among the different image tracks that fluctuate and interact in this work, the paintings could be said to form a separate image track in Jean-Luc Godard’s *Passion* (1982). The references to paintings are here organised in a serial structure. Especially in the more elaborate compilation films, such as *Histoire(s) du cinéma Ia + Ib* (1988), the order of newsreel fragments, classical cinema citations and filmic references to paintings may be said to constitute a web of tracks that interact through the visual montage. Since the video productions of the 70s, decomposition of movement has been a recurrent feature in Godard’s work. By referring to the techniques of Vertov, his theory of the photogram is revived in the context of the influence of the electronic media on film. The decompositions of *Sauve qui peut (la vie)* has placed the photogram as an equidistant extract of movement

under the *zeitlupe*.³⁶

It has also expanded into the sound tracks, where the decomposition of movement serves to single out the “grain of the voice” or the instants of other sound tracks. The implications of this slowing down of the movement of sound is different from that of the photogram. Sound is inconceivable without a diachronical dimension, since various oscillations define each sound. The single constituent in “the movement of sound” is impossible to define, as it is not ruled by the phi effect, or on the play of presence and absence as the photograms. These differences open out for interesting perspectives on temporal and spatial relations between separate dimensions in the film and between cinema and the other arts. There is not room to develop this discussion here. However, it should be pointed out that Godard makes use of this strategy in works like *Puissance de la parole* (1988), *Histoire(s) du cinéma*, *L’enfance de l’art/The Infancy of Art* (1990) and *Hélas pour moi* (1993).

Painting can take a position similar to the decomposition technique on the image track. A couple of examples from *Passion* may serve to clarify how painting functions as a separate image track, and as a separate temporal mode. In this work, the role of painting is related to temporal intervals. When the decomposition sequences of *Sauve qui peut (la vie)* are absent from *Passion*, this is because painting functions in a similar manner. It is however imprecise to say that this film employs the reconstruction of paintings, because one of the themes of the film is how such a reconstruction is impossible in the film medium. Painting is in *Passion* related to the paradoxical condition of the photogram in general. Being a dimension that conditions the whole work, painting is at the same time an impossibility in its isolation, or in its original context (if painting does have one). The film medium can only refer to paintings, and never reconstruct them, as the film and painting necessarily do have different modes of existence in time. This is very clear in this film, where the director (in the story) is unable to recreate the classical masterworks of painting. The editing, camera movements and temporal flow make the tracking shots at first move towards a spatial organisation reminiscent of a well-known painting, only to move away from this suggested organisation the moment after.

Classical painting is based on a privileged instant in a movement, a position maintained by the painting, whereas the film consists of

mechanically selected extracts. For this reason, among others, cinema can not recreate the “privileged moment” of a movement. Most tableaux vivants in the film are shot by a camera in constant motion, sometimes interrupted by fragmentary close-ups. This makes the “virtual” photogram that matches the painting remain absent, as the photogrammatical movement of film is based on equidistant points in a movement. This virtual, “ideal” and matching photogram is nevertheless present as an idea through each of the references to the classical paintings. The “eye’s memory” of the original painting singles out the virtual instant in this movement.³⁷ This approximates the situation of painting on film to the condition of the photogram. The absence of the recreated painting leads to investigations of the differences between the media at the very centre of *Passion*.

This difference in mode between painting and cinema is connected to the frame. The off-screen space of the painting must remain hidden, physically, while the movement of the camera continually reveals new fields that have previously been hidden in the film. When the framing of the image only discreetly borders on, but never recreates, the perspective of the painting that is referred to, it depends on the perpetual reframing of the film. The idea of the photogram is given priority through the use of different tableaux vivants. The “matching” photogram is invoked as a mental dimension since photograms can not be seen in isolation.³⁸ The frame of the original painting is decomposed by the film technology. The movement towards a privileged extract (the painting) is instantly substituted by the movement away from it. Through this strategy the decomposition of the frame of the painting coincides with the decomposition of the cinematographical movement. The statures of the models in the painting references contradict the movement of the film. This results in a vertical or synchronous montage of different temporal modes on the image tracks of the film. *Passion* juxtaposes the equidistant extracts in the time and space of film and the privileged “poses”, the “pregnant moments” of painting.

One reference to a specific painting that is important in a photogrammatical respect is Antoine Watteau’s *L’embarquement pour Cythère*. This sequence distinguishes itself from the other attempted reconstructions of paintings in *Passion*, partly because it is the only one set outside of the “classical”, artificial lighting of the

studio. The painting’s organisation of the characters in a perspective of depth is in the film given only a diachronical rendering, as a long tracking shot gradually reveals this organisation. The painting is in its filmic version given a diachronical extension. During the tracking shot, a tractor enters the frame to decompose the spatial organisation referring to Watteau’s painting. Simultaneously, the camera tracks away from the framing of the painting in order to follow one of the main characters of the film looking for her lover and director, who is “embarking” for Poland. In her search, she encounters three couples after another, with the approximate statures of the three “phases” of movement in Watteau’s painting.

This underlines once more the passing of time during the shooting process, and the difference of temporal modes between the two media. That *L’embarquement pour Cythère* is chosen for attempted reconstruction is symptomatic, since this painting’s spatial organization suggests a diachronical temporal dimension. Auguste Rodin points out in a study that the organization of the characters in the painting implies a line of successive extracts of the same movement.³⁹ Eisenstein takes up on Rodin’s reading, and characterizes the painting’s mise-en-scène as cinematographical.⁴⁰ The painting shows, according to Rodin, successive instants of a “generalized” couple of lovers, first sitting on the grass, then raising, then moving towards the boat.⁴¹ In this perspective the painting has a structure reminiscent of the filmic defilement of photograms. The painting works with a decomposed dimension of movement, a *reading* of which is represented in *Passion*. The other paintings referred to in the film are represented by static tableaux vivants. Watteau’s painting is, to the difference from the others, suggested by characters in movement. A reason for this is that in the spatial organisation already implies a movement through extracted instants. Thus a decomposition of movement is already to be found in the spatial organisation of the painting. The function of this strategy is dual; the temporal differences between painting and film are stressed, simultaneously it exemplifies that an idea of this painting can be treated cinematographically through an investigation of movement.

Godard’s work is in general preoccupied with the differences and relations between separate media. A conception of cinema as an “impure” cultural system of significance makes it well



“The Bather,” after Ingres, in *Passion*

suited for investigations into this field of study. The idea that different disciplines of art hold dissimilar individual characteristics and limits goes at least back to Gotthold Ephraim Lessing’s study *Laokoön* from 1766. Lessing here argues against the supremacy of certain artforms over others, and points out that each form of art has its own specific means, and reaches best its goals by exploiting these possibilities to the full as well as by respecting the limitations of the medium. The argument concerns at first the sculptural and literal (by Virgil) treatment of the *Laokoön* theme, and moves on to general level where sculpture and painting are characterised as spatial and poetry as temporal. Lessing’s aim is also to promote the aesthetical function of art against the prevailing idea at the time that art first and foremost should be an auxiliary to religion and philosophy. This dichotomy of Lessing between the spatial dimension of painting and the temporality of poetry has lead Eisenstein, in his interartial perspective, to see cinema as the medium where this contradiction could be overcome.⁴²

Eisenstein’s position is a revision of Lessing’s argument. The argument should in Eisenstein’s opinion mainly be seen as a distinction in method, and should not be rigidly applied to different artforms. He sees a montage method in Lessing’s descriptions of works of art, and grants

that cinema has certain inherent qualities that should be exploited to the full, but these are precisely to unite the special qualities that have existed in other art forms throughout history. This makes cinema the point of achievement of a movement towards a “total” art. Cinema is suggested as a synthesis of the history of different art forms up to that point in time, and is, implicitly, given a role similar to the development of the Soviet state. Lenin’s attitude towards cinema as “the most important art” should be kept in mind in this context. In a marxist perspective this position is understandable given the context of a young and optimistic Soviet society.

Eisenstein’s view has led to very fruitful interdisciplinary studies. However, some implications of this position seem open to criticism. Whereas Lessing’s position may be taken to promote a certain “isolationism” between the arts, Eisenstein’s approach is highly intermedial and interdisciplinary. But his position situates cinema at the end of the line of a development, and this may lead less cautious theorists to conclude that a certain cinema has a primacy over other art forms. This position also sustains the myth of progress in art, i. e. that art is constantly “improved” towards a state of perfection. The static element in this line of thought is evident, and it fails to account for the dynamic social and historical determinations of a work of art. The idea of progress in art is not fruitful. All individual manifestations inside the separate art forms don’t all have to share orientation or aesthetic strategy to be of interest.

This discussion is interesting with regards to the photogram. Different art forms have in this perspective their unique “tasks”, because they have their own inherent qualities. Poetry has a temporal dimension, but is unimpressive in its spatial dimension (this was before the likes of Mallarmé), whereas painting is fruitful in its spatial dimension and diffuse in its temporal mode. The photogram has similar inherent tensions. In its identifiable shape it is no longer

an element of movement, and in our understanding of the term, no longer a photogram, but a still image. The photogram doesn't exist in its isolation, only in its plural realisation as an element in a larger constellation. This inherent ambiguity of visibility and invisibility, of a temporal dimension and of the absence of such, gives the photogram an existence as an idea. However, this is also a material dimension, and marks a point of convergence of perception and consciousness. In Eisenstein's terminology, this is the instance where the "little frames" simultaneously are representation and "total image". This cerebral potential gives the photogram an interesting position in the investigation of interartial relations. One such investigation is conducted in *Passion* through the idea of the photogram in relation to Watteau's painting. The potential link of the photogram with structures of thought doesn't deny other artforms a conceptual potential, but cinema is the only medium that proceeds through the photogram.

In relation to Lessing's argument, and its revision by Eisenstein, the work of Godard since the mid-seventies offers a third perspective. By making cinema occupy itself with other artforms through citational strategies, the result is a montage which maintains the differences and the intervals between the arts. This position is in fact contrary to the "purity" aesthetics of Lessing. Godard's work has always been marked by a conception of montage as a differentiating element. While early films elaborate the jump cut and distanciation aesthetics, the later productions often establish a distance between the visual and/or sound tracks, and investigate cinematic movement through different techniques of decomposition of movement. This principle of montage serves to juxtapose and relate different media to each other. This is, in contrast to the strategy of Eisenstein, not an undertaking motivated by striving for a synthesis between the arts in cinema itself. On the contrary, the effect is a demonstration and an investigation of the differences and intervals at play through such a juxtaposition. The Watteau example may seem to be an example that contradicts this view, as there is a diachronical aspect both in the original painting and in its filmic reference. But this shows how the media are dissimilar, as the diachronic aspect in the case of the painting is based on a series of privileged positions and that the three instants coexist in time. The filmic depiction of the painting's events proceeds by a

tracking shot, and as a consequence these instants no longer coexist in time. Through the filmic movement the "simultaneity of diachronical events" are rendered as equidistant phases of a movement.

Lessing identifies a spatial dimension in sculpture and painting, whereas literature belongs to the "temporal" arts. Chronophotography and cinema may serve to examine the relations and results from this division. One example of these conflicting functions form a montage in *Passion*, where the privileged poses of painting are contrasted with the chronophotographic equidistances of cinema. *Passion* examines the relations and contradictions between the temporal modes to be found in painting and in cinema. A decomposition of the frame of the painting is undertaken through the movement of the film, and, vice versa, a decomposition of the movement of the film through references to painting.

There are attempts to reconstitute four paintings by Goya in the film. In contrast to the Watteau reference, these works are placed within the artificial lighting of the studio and have immobile models. The four works are spatially related to each other through a sequence of tracking shots that successively frame all references. The sequence starts with *The Third of May, 1808*, continues via *The Naked Maja* to *The Parasol*, and ends by the portrait *Charles IV and his family*. The movement of the camera and the order of the references inverts the chronology of the original creation of the works. Close-ups of details of *The Third of May, 1808*, a tracking shot in front of the victims, then repeated in front of the gunmen, are fragments that interrupt the long shots of the other painting references. *The Parasol* is rendered as a continuous tracking shot in the background of *The Third of May, 1808* and in front of *The Naked Maja*. However, the inverted historical chronology is evident. This way a temporal dimension different to the one presented in the painting of Watteau is introduced. The camera movement adds an inherent temporal order to the painting references, and gives in addition a reading of the works by pointing out a development which would not have been present in the works seen in isolation. The temporal dimension of film allows diachronical juxtapositions that may advance ideas that would never emanate outside of the filmic context.

There is a manifest potential for investigations of the archeological dimensions of a work in this

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technique. When one studies paintings in the “usual” context, in a museum or in a gallery, the diachronical order of the study of the separate works is suggested, but deviations from this order are very frequent. *Passion* introduces an inverted “historical” perspective to an assembly of “attempted” paintings, and constitutes through its diachronic dimension a preliminary “archive” that is not subject to the conventions governing outside of this separate, filmic context, which the temporal dimension paradoxically prevents from being presented distinctly and in isolation. The tracking shots result in each suggested painting being decomposed simultaneously as the next one is in formation. The paintings are never achieved, neither by the organisation of the space through the cinematic technology, nor by the director in the film. Their presence is virtual, and is located on a conceptual level. The privileged pose of the painting is never attained because of the simultaneity of construction and decomposition inherent in film. The photograms are subject to temporal principles different from the poses, and mechanically produced.

Passion shows itself capable of investigating perceptual-theoretical fields of study. The decomposition of movement actualizes various temporal modes within the same work. The idea of the paradoxical status of the photogram is only valid if the phi effect is attributed to cerebral mechanisms. The single photogram *would* have a presence in its isolation if it was subject to a persistence of vision during projection. The reference to paintings in *Passion* shows this. The paintings would have a possible realisation in the film if the retinal afterimage was in function, since the separate photogram in that case would persist on the retina. The only task for the director in the film would be to recreate the lighting and organisation of the space of the original painting. When his task is impossible it is because of the impossibility of the presence of an isolated photogram. Hence, no instant where the filmic image matches the painting is possible. The later work of Godard as a whole draws heavily on the lessons of Dziga Vertov. The photogram is never distinctly visible, but still conditions the visual dimension of the film. This equips cinema with a tool that potentially is able to investigate into perceptual problems and to dismiss the duality of consciousness and matter through decomposition of movement.

Notes

¹ R. Bellour, “L’Analyse flambée”, *L’Entre-Images: Photo.*

Cinéma. Vidéo., Paris: La Différence 1990, 19 - 23.

² S. M. Eisenstein, “Ermolova”, *Cinématisme: peinture et cinéma*. Bruxelles: Editions Complexe 1980, 221 - 248, especially p. 235.

³ L. Moholy-Nagy, *Malerei. Fotografie. Film*. München 1927, 30.

⁴ R. Barthes, “Le troisième sens”, *Cahiers du cinéma*, no. 222, July 1970, 12 - 19.

⁵ S. Pierre adheres to Barthes’ use in “Eléments pour une théorie du photogramme”, *Cahiers du cinéma*, no. 226-227, January - February 1971, p. 75 - 83.

⁶ Metz maintains that the code of movement “...enters into the cinematographical process at the very moment where one goes from the photogram to its negation; this negation is its aim, its specific work” (“...intervient dans le processus cinématographique au moment précis où l’on passe du photogramme à sa négation; cette négation est son but, son travail spécifique”). C. Metz, *Langage et cinéma*, Paris: Larousse 1971, 145. For Kuntzel, this paradoxical status of the photogram makes him describe passing “from the film to the film”, that is from the immobile film strip to the projected film. (From the frame to the photogram, in our terminology). T. Kuntzel, “Le Défilement”, in (ed.) D. Noguez, *Cinéma: Théorie. Lectures*. Paris: Klincksieck 1973, 97-110.

⁷ “[L’image filmique] n’existe que du fait de la continue et régulière substitution des photogrammes: Il faut que ceux-ci disparaissent pour qu’elle soit. Dès que la projection cesse, elle s’évanouit. Bien que les photogrammes soient les éléments constitutifs de l’image animée, on ne saurait les considérer comme autant des parties (ou le mot n’a plus de sens), car dès l’instant que ces parties sont distinctes les uns des autres, il n’y a plus d’image animée.” (“[The filmic image] only exists from the fact of the continual and regular substitution of the photogrammes: They have to disappear in order for it to exist. When the projection stops, it vanishes. Even if the photograms are constitutive elements of the moving image, one couldn’t consider them as parts of it (or the term doesn’t have a sense any longer), since from the moment when these parts are distinct from each other, there is no longer a moving image.” Jean Mitry, *La Sémiologie en question: langage et cinéma*, Paris: Les Éditions du cerf 1987, 40f.

⁸ M. Wertheimer, “Experimentelle Studien über das Sehen von Bewegung” [1912], *Drei Abhandlungen zur Gestalttheorie*, Erlangen: Verlag der Philosophischen Akademie 1925.

⁹ F. Talbot, *Moving Pictures; How They Are Made and Worked*, London 1912, 3ff., and H. Münsterberg, *The Photoplay: A Psychological Study*, [1916] New York: Dover 1970, 25ff.

¹⁰ J. Mitry, *Esthétique et psychologie du cinéma, vol. II: les formes*. Paris: Editions universitaires 1965, or J. Mitry, *La Sémiologie en question: langage et cinéma*, Paris: Editions du Cerf 1987, 56f. and C. Metz, 144.

¹¹ Rudolf Arnheim, André Bazin and Jean-Louis Comolli have to be counted among these. Arnheim points out that Max Wertheimer used to be his teacher, and for this reason he

ought to be familiar with the complexity of the perceptual phenomena that determine the phi effect. R. Arnheim, *Film as Art*. Los Angeles: University of California Press 1957, 162.

Bazin propagates the afterimage position in an article where the factual errors are abundant. A. Bazin, "Le Mythe du cinéma total" [1946], in *Qu'est-ce que le cinéma I: Ontologie et langage*. Paris: Editions du Cerf 1958, 21 - 26. Commolli bases his ideological criticism on that of Bazin, and falls prey to the same misconceptions, in "Technique et Idéologie; Caméra, perspective, profondeur de champ", *Cahiers du cinéma*, no. 229, May-June 1971, 13.

¹² His main rival to this praise seems to be Pierre Jules Janssen, who constructed an "astronomical revolver" in 1873 in order to photograph the passage of Venus near the earth. This device allowed for photographs with seventy seconds intervals on a glass plate, and influenced Mareys experiments to a large degree.

¹³ Marey's projected film strips suffered from a lack of fluent movement that is the prerequisite for the "invisible presence" of the photogram. Apart from the problems with the projector's feeding mechanism, the films themselves suffered from small irregularities in the spaces between the frames. Marey considered cutting out the frames and gluing them together at proper equidistant intervals on the strip. For his own account of the development of chronophotography, see: Etienne Jules Marey, *La chronophotographie*. Paris: Gauthier - Villars, 1899.

¹⁴ Dziga Vertov, "We: Variant of a Manifesto" [1922], in A. Michelson (ed.), *Kino-Eye: The Writings of Dziga Vertov*, (translated by Kevin O'Brian), Berkeley: Pluto 1984, 8f. This position is reformulated and developed in "From Kino-Eye to Radio-Eye" [1929]. In *ibid.*, 85 - 91.

¹⁵ One of the rare occasions when Eisenstein uses the term "interval" is in "A Dialectic Approach to Film Form", where he actualises the quantity of the interval and the musical analogy: (... There can be cases where the distance of separation is so wide that it leads to a break - to a collapse of the homogeneous concept of art. For instance, the "inaudibility" of certain intervals. ...) This passage has a striking resemblance to the rhetoric that Eisenstein often employed in his controversies with Vertov, and the "interval" term makes this implication even more present. We shall later touch upon the "invisibility" of certain of Vertov's intervals. S. M. Eisenstein, *Film Form; Essays in Film Theory*, New York: Harcourt Brace Jovanovich, [1949] 1977, 47.

¹⁶ I prefer the term "alternating montage" to "parallel montage" in this case, as the difference between the terms mainly bears on narrative functions that are not at stake here. Also, "parallel montage" tends, in the present concern with the material aspects of film, to implicate a synchronous and "vertical" montage construction like the image - music relation or the factual double exposure, instead of a diachronical one.

¹⁷ V. Petric, *Constructivism in Film; The Man with the Movie camera; A Cinematic Analysis*, Cambridge: Cambridge University Press 1987, 155 - 164.

¹⁸ *Ibid.*, 221.

¹⁹ *Ibid.*, 147ff.

²⁰ Petric's explanation of the phi effect is incomplete, as he omits the part of the experiments that accounts for the perception of movement. *Ibid.*, 139.

²¹ Petric holds this view based on the "foeva phenomenon", a theory that maintains that separate parts of the retina "filters" what in the visual impression what is to become conscious and not. He bases his arguments in studies of subliminal advertising that today are widely discredited. *Ibid.*, 147.

²² S. M. Eisenstein, "Montage 1937", M. Glenny, R. Taylor (ed.), *Towards a Theory of Montage; Sergei Eisenstein's Selected Works, vol II*, London: BFI 1991, 11 - 58.

²³ Eisenstein praised the German term "Bildausschnitt" in an unpublished text called "Afterthoughts on Stuttgart" from 1929. This term includes both the film image as section chosen among infinite numbers of possibilities during shooting, and the photogram as an extract of movement and the frame. For a discussion of the use of this term in Eisenstein's work, see: François Albera, "Eisenstein and the Theory of the Photogram", I. Christie, R. Taylor (ed.), *Eisenstein Rediscovered*, London, New York 1993, 202, n.9.

²⁴ Eisenstein, "Laocoön", M. Glenny, R. Taylor (ed.), *Towards a Theory of Montage; Sergei Eisenstein's Selected Works, vol II*, London: BFI 1991, 109.

²⁵ *Ibid.*, 121.

²⁶ Albera, 200 - 210.

²⁷ D. Bordwell, "Eisenstein's Epistemological Shift", *Screen* vol. 15, no. 4, Winter 1974 - 1975, 32 - 46. Bordwell sees a change of perspective motivated by the fact that the ideology of the Soviet state undergoes similar changes in this period: "We are left then, not by one but with two Eisensteins. The earlier theorist grounds his system in physiology and dialectical materialism, the later in psychology and empiricism. This, I suggest, explains the contradictions within the entire theoretical oeuvre... Eisenstein's epistemological shift rehearses changes in Soviet philosophy of the time." A discussion of this shift is also to be found in: D. Bordwell, *The Cinema of Eisenstein, Cambridge: Harvard University Press 1993*. Here, the discussion of the film theory of Eisenstein is even divided into one chapter concerning the theory of the silent era (p. 111 - 138) and one called "Cinema as Synthesis: Film Theory 1930 - 1948" (p. 163 - 198). The alleged shift in Eisenstein's theoretical framework and in the ideology and philosophy of the Soviet state is particularly argued for on p. 164 - 168.

²⁸ K. S. Malevich, "And Images Triumph on the Screen" [1925], in *Essays on Art; 1915 - 1928; vol. I*, Copenhagen: Borgen 1971, 226 - 232.

²⁹ Even Eisenstein had an eye for the rhetorical potential of the tradition of painting when he in his controversies with Vertov characterized the latter as a "pointillist" indulging in "easel painting", and the kinoks movement in general as "primitive impressionism". S. M. Eisenstein, "The Problem of the Materialist Approach to Form" [1925], in R. Taylor (ed.), *Selected Works, vol I; Writings 1922 - 34*. London: BFI 1988, 62.

³⁰ "...painting should not be exclusively visual or retinal. It should also be of interest to the grey matter, our appetite for

understanding". Marcel Duchamp interviewed by James Johnson Sweeney in 1955, tape recording transcribed and printed in M. Duchamp, *Marchand du sel*, Paris; Denoël 1958, 159.

³¹ Duchamp was one of the patrons and exhibitors at the "hommage" to Etienne Jules Marey at the Cinémathèque française in 1963. He commented on Muybridge's influence on this painting in a conversation with James Johnson Sweeney, printed in *Bulletin of the Museum of Modern Art*, vol. XIII, no. 4 - 5, 1946, 19 - 21, reprinted in M. Duchamp, 110f.

³² Albera approximates the sequence from *Oktiabr* to the Phenakistoscope of Joseph Plateau and W. G. Horner's Zoetrope, which Eisenstein regarded as the real precursors of cinema. (Albera, 208) It should be noted that this inspiration privileges projection of images over the photographic equidistances of Marey as decisive for the development of cinema. This could be taken as a symptom of the priority of the mental and totality of movement and a subordination of the photogram as the representational.

³³ Barthes touches upon this point in "Le troisième sens": "... on voit que l'art de S. M. Eisenstein n'est pas polysémique: il choisit le sens, l'impose, l'assomme (...); le sens Eisensteinien foidroie l'ambiguïté". ("... one sees that S. M. Eisenstein's art is not polysemic: he chooses the meaning, imposes it, nails it down (...); the Eisensteinian meaning kills ambiguity.") Barthes, 13.

³⁴ "First I find, then I search".

³⁵ S. M. Eisenstein, "Montage 1937", 34.

³⁶ The term *zeitlupe* (temporal magnifying glass) is often used to designate the slow motion or the decomposition of movement.

The idea of an unprivileged, equidistant extract of movement plays a very central part in the philosophy of Bergson and is central to the philosophy of film of Deleuze:

"La révolution scientifique moderne a consisté à rapporter le mouvement, non plus à des instants privilégiés, mais à l'instant quelconque. ...le cinéma est le système qui reproduit le mouvement *en fonction du moment quelconque*, c'est-à-dire en fonction d'instantanés choisis de façon à donner l'impression de continuité." ("The modern scientific revolution has consisted of an approximation of movement, no longer to privileged instants, but to any instant. ...cinema is the system which reproduces movement *through the function of any moment*, that is, through the function of equidistant instants chosen to give the impression of continuity.") G. Deleuze, *Cinéma I; L'Image-mouvement*, Paris; L'Édition de minuit, 1983, 13f. Martin Jay accounts for the tradition of this line of thinking of the visual in *Down cast Eyes; The Denigration of Vision in Twentieth-Century French Thought*, Berkeley; University of California Press, 1993, especially p. 132ff and p. 198ff.

³⁷ I here borrow Jean-François Lyotard's term "la mémoire de l'œil" from J.-F. Lyotard, "L'Acinéma", in D. Nogues (ed.), 362.

³⁸ This mental dimension may seem to resemble Eisenstein's "total image", but differs in the important respect that it is an idea of a single photogram, not a synthetic end product of a structure of takes. Instead of a subordination of the "little frames" (*kadriki*) to a mental product, the mental dimension and the visual are identified in the same entity (the photogram).

³⁹ A. Rodin, *L'Art*, Lausanne: Mermod 1946, 116ff.

⁴⁰ Eisenstein discusses this reading in "Laocoön", 113.

⁴¹ This painting has kept its title even though its shown to be inexact. The situation depicted is rather one of *leaving* the island.

⁴² Eisenstein, "Laocoön", 109 - 202.

