A Way of Seeing What Can Be Looked At: Visual Perception in Avant-Garde Cinema

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Abstract
The great American filmmaker D.W. Griffith once said, "The task I am trying to achieve is above all to make you see." The kind of seeing that Griffith is referring to presumably relates to a cognitive understanding of the world, a process of communication whereby personal beliefs effect change on those of other people; but implied in this statement is also a sense that the best way to make people 'see' or understand, is through the technology of the motion picture camera.

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“A Way of Seeing What Can Be Looked At”
Visual Perception in Avant-Garde Cinema

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Final Project Paper
April 2006
And here, somewhere, we have an eye capable of any imaginings. And then we have the camera eye, its lenses grounded to achieve 19th-century Western compositional perspective in bending the light and limiting the frame of the image just so, ... its lenses coated or provided with filters, its light meters balanced, and its color film manufactured, to produce that picture postcard effect (salon painting)...  
—Stan Brakhage, *Metaphors on Vision* (15)

Only the impassive lens, stripping its object of all those ways of seeing it, those piled up preconceptions, that spiritual dust and grime which my eyes have covered it, is able to present it in all its virginal purity to my attention...  
—André Bazin, *The Ontology of the Photographic Image* (199)

I. Introduction

The great American filmmaker D.W. Griffith once said, "The task I am trying to achieve is above all to make you see." The kind of seeing that Griffith is referring to presumably relates to a cognitive understanding of the world, a process of communication whereby personal beliefs effect change on those of other people; but implied in this statement is also a sense that the best way to make people 'see' or understand, is through the technology of the motion picture camera.

André Bazin and Stan Brakhage, in the quotations above, represent antithetical takes on how the images produced by the motion picture camera can enhance human vision. Their belief in the cinema’s capacity to reveal truth indicates that in both cases,
the camera — if used correctly — can convey information about the world inaccessible to
the naked eye. In the process of watching a film, these authors argue, something is
revealed to us about the way that we see, something which makes itself available only
through cinematic intervention. In the case of Bazin, the camera paradoxically offers a
vision more unmediated or direct than ‘real’ perception itself; the true state of the world
seems accessible exclusively through the lens. For Brakhage, what becomes possible
through cinematic vision is the visualization of sight itself, the direction of attention to
one’s own experience of seeing. The difference between these two lines of argument
stems from opposing views on the presumed nature and quality of direct vision, and
concomitantly, conflicting interpretations of what constitutes our visual reality. Bazin’s
quotation suggests that ordinary human vision is fundamentally flawed. Subject to
volatile emotional states, attentional deficits, and other cognitive processes, our
perception is murky and incomplete. As a scientific tool free of idiosyncrasies, the
camera assumes a purifying role, ridding human vision of impedimenta to present an
‘objective’ image—and thus bring world and viewer into greater intimacy.¹ Bazin’s
rhetoric of decontamination through objectivity prescribes the ‘correct’ way of using the
camera: abstaining from any expressive or abstracting techniques that may obfuscate
vision, a filmmaker must work toward a concrete rendering of space and time by creating
optimal conditions for viewing.

Like Bazin, Brakhage conceives of human vision as murky and confused. But if
Bazin considers inconsistencies across different visual experiences a source of perceptual
deficiency, Brakhage thinks of this subjectivity as the optimal form of vision. Stripped of

¹ That photographic technology bears in its mechanism the source of reality or objectivity for Bazin is
evinced in his constant reference to the ‘objectif’, the French word for lens, which literally means
subjective markers, the image can only amount to a false — incomplete — account of vision. The camera’s salvaging function is to recuperate the quirks of sight, to invest the image with all those ‘flaws’ that Bazin bemoans. In this economy, the value of the camera lies in its ability to capture the experience of the feeling subject, and not of the physical world itself. Correspondingly, to use the camera ‘correctly’ one must eschew those rigid optimal conditions favored by Bazin and welcome the fuzziness of vision.

I begin with these two cases because, as irreconcilable accounts on the perceptual fidelity of the cinema, they question the possibility of ever attaining a full understanding of vision through either strategy — Bazin’s more scientific, concerned with truth to the world; and Brakhage’s more artistic, preoccupied with truth to the subject. The lack of consensus on how to represent vision artistically reflects a profound explanatory gap in the scientific world in regards to perceptual processes. But if they recognize the challenge, these two accounts also posit the cinema as a pivotal tool in this pressing, ongoing investigation; and suggest that the two paradigms — truth to the world and truth to the subject — need not mutually exclude each other. However different their suggested approaches, Bazin and Brakhage both identify cinematic vision as a surrogate for human vision, capable of filling the explanatory gap in perceptual studies.

In their celebration of the camera’s privileged relation with human vision, Bazin and Brakhage echo decades of thought on the elucidative powers of this technology. The advent of the motion picture camera at the turn of the century had brought hope, for both artists and scientists, that much of the perceptual riddle might, after all, be solved: here was a machine that could show us how we see, both in terms of phenomenology and

‘objective.’ The objectif, as the fundamental cog in the camera’s mechanism, thus symbolizes (and concretizes) the medium’s ‘unbiased’ relation to reality (Bazin, 197).
physiology. Strong parallels for both the mechanism of the camera and its resulting image could be found in the anatomy and output of the human visual system. As respective synecdoches for corresponding optical systems, the camera and the eye became kindred partners in what would prove to be a most steadfast metaphor for vision, termed — for the purposes of this discussion— the analogy of eye and camera.

The origins of the theory can be traced as far back as Leonardo da Vinci’s ruminations on the *camera obscura* in the late fifteenth century. By the early seventeenth century, largely owing to the work of Kepler and Descartes, casual comparisons between the eye and camera had given rise to a full-fledged explanatory model, which would remain virtually unchallenged all the way through to the nineteenth century. Intellectuals from diverse fields have since questioned this model of vision. While some authors have refuted the value of the analogy on the basis of perceptual accuracy, as is the case with psychologist J.J. Gibson, other thinkers, such as Jean-Louis Comolli and Jean-Louis Baudry, have assumed a more subjective focus, suggesting that the highly contrived ‘perceptual reality’ found most often in commercial films captures too little of what perception feels like.

Nonetheless, the belief in the formative power of the camera-as-subject persists in one form or another to this day—Bazin and Brakhage are good cases in point. As well, the use of point-of-view or ‘subjective’ shots in commercial cinema, and the effacement of the apparatus to create a sense that the recorded image is *identical* with our world, are two manifestations of this enduring model. Evidently, the figure of the camera-eye provides a useful reference point: whether to espouse or reject it, artists continue to engage with this notion. What are its limits, and what are its advantages? What fundamental assumptions does it make about vision, and how can it help film accomplish
its raison d'être, which is, in Dudley Andrew's words, to "pose questions about seeing" (Wees 35)?

I am interested in the way that the dialectic of eye and camera has been appropriated and differently employed by artists in order to further particular beliefs in regards to both perception and its representation—particularly in response to the presumed visual ideology of the Hollywood industry.² In the modernist avant-garde films of the early twentieth century, the metaphor is not only a prominent visual leitmotif, but a driving ideology. If Salvador Dalí, Luis Buñuel, Fernand Leger, and Jean Cocteau suggest an implicit reciprocity between film and vision, Dziga Vertov and Man Ray make this equation explicit by superimposing an eye on the camera lens. These artists' vested interest in the camera-eye stems from a belief in the supremacy of the camera over the eye; their strategy is a fervent celebration of a technology capable of surpassing the limits of human vision. Here the campaign against the hegemonic vision espoused by

² The classical film industry is generally characterized by an emphasis on narrative, which depends on the creation of a seamless, clear representation of the physical world—one that, if not completely true to our perception, is amenable to the viewer's suspension of disbelief and subsequent concentration on the film's story. For my interpretation of the classical prototype Brakhage criticizes I rely heavily on the descriptions of the industry put forth by Timothy Corrigan in The Film Experience. Hollywood's preoccupation with storytelling requires an unobtrusive visual style, termed the "Hollywood continuity style," which ensures verisimilitude or convincing appearance of the portrayed world. Continuity style is effected both through narrative conventions and editing patterns (among other strategies). Examples of the first are a strictly linear chronology (which allows room for flashbacks and other allusions to time so long as temporal cohesion is not disrupted), a central character or group of individuals who propel the plot through a logic of cause-and-effect, a goal-centered plot with a clear resolution, and a restricted or omniscient narrator to convey the story. The main tenet of editing continuity is that one shot follow logically in both time and space from the previous one; in other words, that images bear a clear relationship to each other. Examples of this tradition are: establishing shots and reestablishing shots, the shot/countershoot, the circumscription of space to an imaginary 180° line, the eyeline match, and the match-on-action (perhaps the most crucial of all editing techniques, since it ensures completion and coherence of one action from one shot to the next).

As the formula for successful filmmaking progressed, Hollywood became more and more concerned with a fuller development of narrative verisimilitude, aided by a more compelling inclusion of the viewer's perspective into both editing and narrative action. Critics of the classical narrative cinema paradigm have suggested that this form "affirms the values of middle class culture, such as the agency of the individual, the transparency of realism, and the inevitability of the status quo, through processes of identification, verisimilitude, catharsis, and closure" (453). For more information on the values and traditions of classical Hollywood cinema, see Corrigan.
Hollywood originates from a sense that classical cinema attempts merely to *mimic* natural perception, thus limiting itself to representing what we see instead of what we *could see* if our eyes were as advanced as our technology.

In contrast to this rather indifferent relation to the conceptions of ‘natural perception’ professed by the classical film industry, the avant-garde films of Stan Brakhage (and to a great extent, of Michael Snow, Paul Sharits, and Jordan Belson) launch a deliberate attack on Hollywood’s standardization of vision, and particularly on the use of linear perspective as a stamp of objectivity and realism. Instead, he attempts to appropriate the mechanism of the medium to convey his personal, subjective, artistic vision (significantly, as the paper will argue, through a rhetoric that seems to make *his* vision into a standard— the more ‘correct’ standard— and thus underscores a tension within his own project).

I have chosen to focus on Brakhage for two reasons. The first is that his prolific output consistently engages the subject of visual perception, and virtually nothing else. The vast majority of Brakhage’s oeuvre can best be described as essays on vision. This pronouncement may not appear unique to Brakhage, or *any* filmmaker for that matter—in a fundamental sense, all filmmakers address aesthetic matters, when we consider ‘aesthetic’ (‘sense knowledge,’ from the Greek *aesthesis*) to refer to anything that can be perceived by sensation. What makes Brakhage a visual essayist is the extent to which he critically and self-consciously reflects on the nature of both the cinematic *and* the optical image; and the fact that he articulates his cinematic visions as methodical investigations on visual perception. In other words, Brakhage seeks to establish an “art of the eye” (Wees 1) that reflects its commitment to the physiology as well as the subjective experience of vision.
The second reason for my focus on Brakhage is that his films are accompanied by a vast collection of manifestos, essays, and other texts which explicitly assess the relation of his films to the subjective experience of vision. His writings are valuable because they raise vital questions about vision and its representation, but also about his own exercises in perception, and the extent to which they present a form of vision that is more valid and ‘accurate’ than the standardized commercial image. Because of its wide circulation and popularity within scholarly circles, Brakhage’s prolific written work also points to a contradiction in his celebration of vision over language, and suggests that a full explanation of vision may not be possible without the word. I address these writings, and their paradoxical relation to his films, later in the discussion.

The paper will (a) provide a brief history of how the analogy of eye and camera came into being; (b) review the main literature on the subject, exploring scientific and artistic takes on the advantages of the analogy throughout different periods of time; (c) analyze the ways in which the analogy has been taken up by the avant-garde, in contradistinction to Hollywood’s ‘natural perception,’ to subvert the cinematic apparatus and the pictorial / perceptual conventions it promotes. Finally, (d) I will attempt to evaluate the extent to which Brakhage succeeds at providing an alternative, authentic visualization of perception through the camera-eye, and determine the value of his contribution to film and perceptual studies at large.

Using Brakhage as a study case and the analogy of eye and camera as a general framework, this paper aims to raise significant questions about the possibility of showing the experience of human vision through the cinema: how can film (to the exclusion of other visual forms) reveal to us ways of seeing, and how do practices in the medium
contribute to a wider study of vision? How does Brakhage's work, specifically, weigh in on this discussion?

II. Origins and Manifestations of the Camera-Eye

When images of illuminated objects...penetrate through a small hole into a very dark room...you will see (on the opposite wall) these objects in their proper form and color, reduced in size...in a reversed position, owing to the intersection of the rays.

Leonardo da Vinci, 1519 (Notebooks)

The genesis of the camera as a paradigm of vision can be traced far back beyond the advent of photographic technologies; indeed, important precedents for this scheme can be found in accounts of vision that predate modern theories by centuries. The earliest perceptual theories can be attributed to the Greeks. David C. Lindberg identifies three ancient approaches to the study of vision: the medical tradition exemplified by Galen, which focused on the anatomy and physiology of the eye, its diseases, and possible remedies; the physical or philosophical method of such figures as Democritus, Plato, and Aristotle, who tackled questions related to the epistemology and psychology of perception; and the mathematical approach demonstrated by Euclid, Hero, and Ptolemy, which provided a geometrical explanation for spatial/three-dimensional perception (1). These three ancient approaches contributed, in more or less direct ways, to the eventual comparison between eye and camera.

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3 Ancient Chinese civilization offered significant theories about optical effects caused by mirrors and other reflective surfaces which date to about 500 BC. These did not, however, culminate in organized hypotheses of perceptual processes and their nature. The Egyptians had been at the forefront of ophthalmology, and had developed advanced diagnoses and treatments for eye diseases. Their important medical findings were recorded in papyrus and would provide a template for subsequent investigations in ocular maladies. Their interest in the protection of the eye stemmed from a belief in its magical powers, rather than an interest in perception itself. As such, these findings would not become part of a cohesive body of perceptual theories,
The medical tradition provides the anatomical descriptions that would make a comparison with the structure of the photographic apparatus possible, namely the iris, the reflective surface at the back of the eye (retina), and the lens. The mathematical tradition, primarily represented by Euclid, laid the foundations for future geometrical explanations of vision, that would in turn account for the basis of the photographic mechanism. Euclid's assertion that rays of light diverge indefinitely from the eye and in infinite directions was fundamentally erroneous in its assumption that the rays originate in the eye and flow outward onto the world, when the opposite is true; however, it correctly emphasized that light is a prerequisite for vision, and that what we see results from the convergence of a set of rays of light in our eye—what he described as a "cone of which the vertex is the eye and the base is at the surface of the objects seen" (Lindberg 12). Euclid's studies, focused entirely on the physics of light in relation to the eye (and utterly unconcerned with physiological or psychological aspects of vision) laid the groundwork for the later practitioners of *perspectiva*, whose concern for the accurate two-dimensional representation of visual space required knowledge only of the geometry—and not the physiology—of vision (Lindberg 149). The 'perspectivists' would in turn develop the geometrical theories that made possible the invention of photographic technology.4 Perhaps the most significant precedent for the development of the camera as perceptual model, however, can be located in the physical/philosophical branch of Greek perceptual theories, for it is this group which would provide a platform for the discussion of

and the task of studying the physiology and process of vision would be taken up centuries later by the Greeks.

4 The 'perspectivists', so termed by David C. Lindberg, refers to the group of theorists in the mathematical tradition who were concerned with the geometry of sight, and how a mathematical representation could explain the functioning of our three-dimensional vision (251). The findings of Euclid, Ptolemy, Al-Kindi, and others would eventually form the basis of the photographic mechanism. Indeed, their explanations of
‘images’, ‘pictures’, and other notions of mental representations as integral components of the visual process.

While the first unambiguous description of an image within the eye (termed *pictura*) would not appear until the seventeenth century, suggestions of such a concept evolved in the context of the intromission - extromission debate. The first term refers to the belief that sight depends on the eye’s receiving of a substance, while the second concerns the theory that sight occurs when the eye emits that substance. In other words, the debate centers on a question of ocular input and output, regardless of whether the substance emitted is light or a physical semblance of the object being seen. The group of theorists known as the Atomists, which included Democritus, Epicurus, and Lucretius, can be classified as intromission theorists. They believed that objects cast off impressions or likenesses called *eidola* or *simulacra*, in the manner that animals shed their skin. These material films propagated into the air would shrink as they approached the eye, and once in the eye would be minuscule. The Atomists (dubbed as such for their belief that the films were composed of many particles, or atoms) derived their convictions from the observation that when we scrutinize a person’s eye we may see in it a reflection of the individual’s visual field; the presence of this picture on the eye was taken as proof that there was an actual copy of the world lodged firmly *within the eye*. While this theory fails on many accounts, it constitutes one of the earliest affirmations of the existence of image-like forms in the front-end of visual perception that closely correspond with the world.

Assuming a contrasting stance, Plato’s hybrid extromissionist--intromissionist theory posited that a “visual fire” emanates from the eye and mixes with daylight to form the behavior of light as it passed through the eye, and the resulting inverted image, indicated how a three-dimensional scene could be captured mechanically by such a device.
a sensory body that extends from the eye to the object, thus functioning as an indiscernible ‘medium’ between the object of vision and the observer. Aristotle, rebutting Plato’s theory, stressed the implausibility of such an account on the grounds that a visual fire emanating from the eye would have a hard time reaching remote objects such as the moon. He proposed instead that during the process of vision, the ‘transparent’ (or medium) between the observer and the observed becomes altered in the manner of the latter, so as to transmit its qualities directly to the eye. In other words, the medium assumes the color, shape, or size of the particular object of vision, and through propagation transmits these states to the sensory body within the eye. At stake in these exchanges was the source and cause of the visibility of the object, and whether this source—be it light, eidola, visual fire, or a ‘transparent’—is a physical or immaterial substance. The nature of the substance connecting the observer with the observed underlies a major question in the modern theories of vision formulated in the sixteenth century: how could a physical object in the world be converted, through light, into the insubstantial image present in our visual system?

A possible explanation for this phenomenon would only emerge with the development of a new optic device: the camera obscura. Though Leonardo da Vinci has frequently been credited with the invention of this contraption, its use has been recorded in writings that date back to the ninth century. By the thirteenth century it had become prevalent in astronomical studies, and in the fourteenth and fifteenth centuries was made available to a wider segment of the population. Around 1490, da Vinci began using it for his own astronomical investigations. While testing the effects of different aperture sizes on the image captured in the camera obscura, he developed a theory of vision based on corresponding qualities between the device and the human eye. He noted that the aperture
of the *camera* carried out the same function as the aperture of the pupil; in passing through this aperture, light rays would cross and converge on a particular point, forming an inverted image on the back of the *camera obscura*—and by extension, in his analogy, in the eye as well. He used the camera to show that the process of picture formation in this device was highly comparable to the process taking place in the eye:

> The experience which shows that objects send their intersected species or similitudes inside the eye in the albugineous humour is shown when the species of illuminated objects pass through some small round aperture into a habitation that is very dark, then you will receive such species on a white piece of paper...placed in such a habitation somewhat near this aperture and you will see all the aforesaid objects on this paper with their proper shapes and colours but they will be smaller and inverted as a result of the said intersection.... (*Notebooks*)

This statement implies a correlation between the ‘view’ of the world formed in the eye and the picture formed in the back of the camera. While Da Vinci does not explicitly align the back of the eye to the back of the camera—he does not assert that images *project* onto the retina—he draws an explicit parallel between the eye’s inverted view and the camera’s inverted image (Lindberg 164). Da Vinci performed copious experiments with the *camera obscura* to pursue its correlation with the eye by investigating the source of other optical phenomena such as shadows, gradation and intensity of light, and so on. After dedicating over two hundred drawings to the subject, he became adept at using knowledge of the physics of light gained from his experiments to present the human eye with a representation of the world, so convincing precisely because of its proximity to the eye’s own inverted view of the visual field.
Da Vinci’s observations indicated that correlations between the eye and the camera existed—significantly, he showed that the rays coming from any visible object would cross or intersect with each other at the eye, to form an inverted image; and he identified the crystalline humor (or lens) as responsible for this refraction. But as a self-educated man without access to scholarly traditions, da Vinci would remit full development of his findings to later theorists. His work would remain relatively unknown until the eighteenth century, and so the theorists immediately following da Vinci were most likely unfamiliar with his manuscripts (which were for the most part privately owned). Nonetheless, the accounts that followed chronologically from da Vinci’s—whether they were acquainted with his work or not—develop more fully his tentative comparison between eye and camera obscura.

This analogy would gain impetus with the findings published in Johannes Kepler’s Ad Vitellionem paralipomena of 1604. In his seminal work, Kepler distinguished between an imago, that which could be seen in the environment but not captured or measured; and a pictura, which could be focused on a particular surface, and thus be retained and measured. Considering the former to be purely subjective, he dedicated himself to the description of the formation of the objective pictura, which was bound to the physics of light. Using geometric optics and his knowledge of the behavior of light, Kepler surmised that the lens of the eye focuses all available rays on the retina, producing an inverted image on this surface. He did not specify how the inverted image was turned upright by our visual system, but his discovery inspired the German priest Christopher Scheiner to design an experiment whereby the retinal image of a human or

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5 Lindberg asserts that da Vinci “was isolated and without influence,” and that his manuscripts remained largely unavailable until the end of the eighteenth century (168).
animal eye could be displayed, and the inverted retinal image confirmed. Scheiner’s 1619 experiment, described in Descartes’ 1637 *La Dioptrique*, demonstrated that “the objects we look at do imprint very perfect images on the back of our eyes”⁶ (Wees 34). Impelled by Da Vinci’s earlier comparison of the eye to the *camera obscura* and Scheiner’s encounter with the inverted image, Descartes elucidated that “the chamber represents the eye; this hole, the pupil; this lens, the crystalline humor…and this cloth, the interior membrane” (Wees 35). To Descartes, this experiment suggested that the eye and the *camera obscura* formed an image by virtue of the same mechanism, and that an analogy between these two image-making devices was not only legitimate, but also conducive to further discoveries in the realms of science and technology.

By the early seventeenth century, then, Da Vinci’s timid comparison had matured into a widely accepted account of human vision. The model’s explanatory success forged a strong link between the empirical study of vision and theoretical frameworks deriving from geometric optics and the physics of light. The elucidation of image formation by means of Euclidian rules had proved so successful in explaining how light could give rise to a perfect picture, that it seemed only natural to suppose that a mathematical system could also be employed to translate the pictorial qualities found in the retinal image into a literal picture. If vision was indeed “the perception of the image of the object painted on the retina” (Wees 36), then the same physical rules that accounted for this retinal image could ostensibly provide a means of reproducing the retinal image on a material surface. Pictorial (linear) perspective offered just such a means. This set of conventions, based on

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⁶ In this experiment, the eye of a large animal or human is surgically removed promptly after death, and the membranes at the back of the eye carefully cut away. Covering the back with a thin, translucent paper or eggshell, the eye is then placed in such a way that the pupil is facing the view outside a window, and the back of the eye remains in complete darkness. Looking at the back of this surface, an observer will see an inverted image of the scenery outside, confirming Kepler’s predictions.
geometric rules of projection, allowed the artist to represent various three-dimensional objects on a two-dimensional surface, in the relative size, shape, and position they would appear to an observer from a single point of view in the real world. This technique soon became absorbed into the dominant forms of visual art as the only accurate way of depicting three-dimensional space on a two-dimensional plane.

The invention of the photographic camera in the nineteenth century arose from such conventions. Its mechanism derived from the optical qualities of the camera obscura, and its structure seemed to duplicate the eye's to an even greater extent, with a flexible aperture and convex lens able to translate light into a representation of varying distances, depths, sizes, and textures. In keeping with the perspectivist vogue of the time, the photographic camera incorporated the single viewpoint onto which all lines converged, resulting in a picture much like those drawn by hand in da Vinci's time. As the modern inheritor of the perspective system, the new technology acquired a status of transparency in relation to physical reality. Its foundation on linear perspective, bastion of three-dimensional representation, essentially made the photographic image an extension of the retinal pictura. Concurrently, the cinematographic camera developed in the late 1890s acceded to the legacy of the camera obscura, the perspective system, and the recent photographic technology. If these systems provided an accurate scheme of the static visual world, the motion picture camera offered an incomparable view of the dynamism and interactions that make up human lives.

In this respect, the motion picture camera would become paradigmatic of human vision. Like nothing else before it, this device duplicated the experience of seeing in a real, moving, and changing environment. What was lacking in painting, sculpture, and photography, and made these representations seem contrived and unnatural, was now an
integral part of the image—the new camera could capture the trajectory of light in time, and thus replicate the spatial and temporal qualities of our lived experience. Improvements in technology would bring color and sound to the moving image, strengthening sensory and spatial correlations with the physical world. Experimentation with cinematic vocabulary gave rise to the subjective perspective or point-of-view shot, a strategy which attempted to duplicate all the stimuli available to an individual from his/her point of view; the mimetic success of this technique corroborated the belief that the camera and the eye were kindred mechanisms of vision. Significantly, the incorporation of motion and temporality into the cinematic image pushed the analogy of eye and camera to a different plane. Rather than suggest an equivalence between the retinal image and the cinematic image, these real-time cues alluded to an even greater correspondence between the visual system at large and the cinematic experience. The flat, inverted, and static retinal image yielded to higher-level forms of cognition and processing as the anatomical counterpart to the cinematic mechanism. By the turn of the century, cinematic and physical experiences had achieved a great correspondence, suggested by early audiences’ visceral reactions to the visual representations of the world in film.⁷

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⁷ The mimetic power of cinematic vision is such that, as the story goes, cinema’s earliest audiences could not distinguish between real, physical experiences and those simulated by the cinema. A textbook example is the famous tale of an audience’s crazed and visceral response to the first screening of a fast moving train approaching a station. Employing point-of-view perspective, the Lumière’s L’Arrivée d’un Train à la Ciotat (1895) allegedly caused cinemagoers to run out of the theatres in absolute panic. Though this anecdote has acquired the status of a myth, it points to the cinema’s convincing emulation of visual perception (Gunning 818).
III. Assessment and Reception of the Camera-Eye

Muddles and misconceptions prevail. We are led to conceive a sort of apparatus inside the head that is similar to the apparatus for making a picture show outside the head. We have been taught that a picture is sent up to the brain and so we conclude that a series of pictures can be sent up to the brain. We all know what a snapshot is, and we know that a film is a series of snapshots. If we are told that a movie presents us with a sequence of retinal snapshots joined by what is called the "persistence of vision," we believe it. But we are misled.

—J.J. Gibson, The Ecological Approach to Visual Perception

The first decades of the twentieth century saw the rise of conflicting views on the viability of cinematic vision. Mounting enthusiasm for the professed reality of the cinematic image simultaneously lead to skepticism on the part of many contemporary thinkers. The debate between these two factions hinged on notions of the indexicality and fidelity of the image in regard to the real world. Although somewhat reductively, the discourse on photographic reality can be characterized as a fundamental split between those who believe that the image represents not only what was present but exactly how it looked to the person at that precise moment — and that as such images offer a figurative slice of reality; and those who, on the contrary, think of the image as a distorted, limited construction of the world. A review of the literature on the reality of the photographic image is outside the scope of this paper. More apropos to the discussion at hand, the debate also manifested itself as a rumination on the illusion of reality as well as the medium's capacity for offering a different view of the world. This brand of the debate obviated a discussion of film's ontological relation to the world by implicitly

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8 For more on the subject of reality in the cinematic and photographic image, the reader is referred to Andre Bazin's "The Ontology of the Photographic Image" in Braudy and Cohen eds. Film Theory and Criticism, 195-99; Richard Allen's Projecting Illusion: Film Spectatorship and the Impression of Reality; Gregory Currie's "Film, Reality, and Illusion" in Bordwell and Carroll eds. Post-Theory, 325-44; and Kendall L. Walton's "On Pictures and Photographs: Objections Answered" in Allen and Smith eds. Film Theory and Philosophy, 60-75.
acknowledging film’s artifice. Their discussions took as a starting point that the cinematic medium was a representation—not a reflection—of the world, and that it was a valuable tool insofar as it did not lay claims to truth. The rift among the thinkers had to do, rather, with what form this representation took in relation to physical reality—whether the approach was mimetic or imaginative. In this context, the camera-eye analogy functions less as a physical equivalence and more as a figurative tool; it posits that the camera and the eye are analogous on the level of our sensation or experience of visual perception of the world only, and not on an ontological level.\(^9\) The latter interpretation will be the one employed from this point forth in the paper, and the theorists and artists cited for the criticism and defence of the analogy in the section that follows contribute to its elucidation in the strict sense just defined.

Although primarily concerned with the ontology and veracity of the image, the theories of André Bazin provide a solid ground on which to begin the discussion. Bazin’s view is that the photographic camera and its progeny, the motion picture, are by virtue of their scientific precision duty-bound to the depiction of the real. Unlike a painting, “photography affects like a phenomenon in nature” (198); by extension, he claims that

\(^9\) Here it might be useful to distinguish between two distinct theories with regard to ‘realism.’ The first theory believes that the very method of photography bears a direct relation to the ‘real’, that it can mechanically record the physical world and thus offer a reproduction, and not a mere representation, of what we see. This doctrine of “transparency” posits the cinema as a ‘window onto the world,’ through which we see reality unimpeded—a theory represented best in Bazin’s approach. Supporters of the second theory believe that the experience of watching film closely resembles our normal perceptual experience of the physical world; this notion of “perceptual realism” rejects the “transparency” claim that what we see through the camera is the world, and asserts that the cinema is ‘realistic’ only insofar as it successfully recreates the experience of perception. Interestingly, Bazin also represents this theory to some extent, in his recipe for ‘realistic’ filmmaking; ‘perceptual realism’ is the practical application of the cinema’s ontological transparency—for example, the use of long-take and deep focus in film only instantiates the cinema’s ability to reproduce the fluidity of space and time in the physical world. However, perceptual realism can be expanded to include other markers of verisimilitude (for example, the subjective view of a runner), not just the long-take and deep focus. The theorists cited from here on consider the ‘realism’ of cinema to reside in this second interpretation—perceptual realism—and not transparency.
film objectively records sensory data, the very same information we would encounter if
we witnessed the scene directly. Recognizing that film can never fully merge with life,
Bazin only asks that it remains an art form dedicated to the promotion of universal rather
than subjective ways of seeing the world. The value of the cinema lies in its ability to
homogenize varied points of view, to reveal what things without the effects of personal
emotions and biases: “only the impassive lens, stripping its object of all those ways of
seeing it, those piled up preconceptions, that spiritual dust and grime which my eyes have
covered it, is able to present it in all its virginal purity to my attention” (199). The cinema
promoted by Bazin shuns showy or excessively imaginative techniques in service of
fantasy, and instead makes the artifice of the medium invisible by working within the
most muted parameters of the cinematic apparatus—deep focus, long takes (unobtrusive
editing), natural lighting and sound, and a lifelike mise-en-scene. For placing “their faith
in reality” and not in the image, Bazin praised filmmakers who worked within a range of
‘realisms’ ranging from Italian neorealism to the classical films of Hollywood, and
especially of Orson Welles. The theory expressed by Bazin and practiced by directors
working within traditional cinematic norms is that in order to maintain its verisimilitude,
film must remain as true to its nature as possible. In keeping with this view, it is
necessary to consider the following: what are the techniques inherent to the motion
picture that make it so germane to the representation of reality?

Many thinkers have offered reasons for the sensory and emotional correspondence
between cinematic and physical experiences. Theories on the cinema’s affinity with the
real world span a wide range of disciplines. While much of the literature on this topic
covers psychoanalytical, semiological, and sociological research on the correspondence
between the moving image and lived reality, the theorists reviewed here are those who
study the resemblance from a strictly cognitive-perceptual, or phenomenological, point of view. These thinkers, in other words, provide concrete reasons for the perceptual realism of films. As a structural note, their various theories will not be arranged chronologically, but rather according to how they relate or spark responses among each other, thus bringing out the conflict inherent in the camera-eye model.

Any perceptual analysis of photographic technology must begin with the work of J.J. Gibson, who offers perhaps the most exhaustive research and thorough analysis of the strengths and limits of the camera as an analogue to human vision. In his ecological theory of perception we find explanations for the conformity of the image to our physical experiences, and arguments for the camera’s ultimate failure to appropriate human vision. More so than any other theory, his resonates with the mechanism of the camera for its emphasis on perceptual activity as a direct ‘picking up’ of information from what he terms the ‘ambient array of light’. The array at a particular point is formed by the perspective projections of all those permanent things in view and the varying perspectives of things in motion (221). According to him, vision does not necessitate inferential processes or access to memory (as Helmholtzian theories suggest) because the environment is sufficiently rich in information to convey data about size, texture, and distance directly to the sensory receptors in the eye through these projection lines and their changing perspectives. Through his research on the perception of pilots while landing planes on a field, he concluded that under normal conditions – that is, when the observer is active in his environment, and not bound to data from a static, single eye — variations in texture gradients create ‘flow lines’ of motion which carry crucial information about distance and size. Thus, visual perception works much like a camera in the sense that it images external objects and projects them onto the field of view; the eye,
like the camera, is an information-gathering instrument, not a surface on which objects ‘impress’ sensations, as Helmholtz believed. According to Gibson, the optic array of an image or ‘representative display’ yields much of the same information available to an observer in the world. “It is a substitute or surrogate,” he claims, and then, significantly, “an image is a means by which the artist can enable others to see what he has seen” (225). Gibson will later explain where this assertion fails; but for now, we may ask how closely the image approximates the ambient optic array of a certain part of the world, and how it achieves this correspondence.

Gibson’s answer to these questions seems simple enough: artists and camera technicians succeed at replicating a part of the world because they “structure light by the same methods that structure light in the environment” (231). It makes sense to think that the closer the optic array of an image approximates the structure of the optic array in that particular part of the world, the closer the image will be to the real percept. The motion picture carries even more information than the still photographic image because it conveys data about transformation in the array (through changes in perspective projections) which in our experience in the world comes from retinal motion perspective (motion parallax)\(^\text{10}\) and specifies changing distances and sizes. The strength of cinematic motion is precisely that in addition to showing the movement of objects in relation to a stationary observer, it can induce the perception of movement through space of the observer himself (locomotion) by assuming a point-of-view shot which duplicates the viewer’s changing optic array resulting from motion parallax.

\(^{10}\) In Gibson’s theory, motion parallax is described as a particular example of retinal motion perspective (the motion of the subject rather than of the object) and refers to the special case in which ‘the line of regard is at right angles to the line of motion’ (Motion Picture 20).
Gibson’s idea that simulated movement in the cinema resembles the perception of actual motion because both types of perception are mediated by the same brain processes finds currency in the perceptual theory of Joseph and Barbara Anderson. In “The Myth of Persistence of Vision Revisited,” the authors state that our experience of motion in the cinema comes from the presence of two (or more) closely spaced displays, a phenomenon called short-range apparent motion. An illusion of motion results when two motionless forms are separated in space only minimally, so that when presented sequentially they create an illusion of motion (presumably because such ‘fine-grain’ differences in position between these shapes cannot be captured by our visual system). Contrary to the widely circulated belief that successful simulation of motion in the cinema derives from the ‘persistence of vision’ (whereby the eye is said to ‘retain’ images for a split second so that two images seem to overlap or fuse) Anderson and Anderson ascribe this phenomenon to visual processes that begin on the retinal level and continue to higher perceptual areas of motion such as MT. Just like real motion, the processing of short term apparent motion originates in low-end areas of vision, starting with M-cells (a specific type of retinal ganglion cells) which lead up to the magno stream in the latero-geniculate nucleus to form the so-called ‘where’ pathway in the dorsal brain area, responsible for processing motion.\footnote{Apparent motion is a phenomenon common to everyday life, and not only present in the motion picture (neon arrow signs are one ordinary example). There are countless illusions, such as the waterfall illusion, which also exemplify this experience and which we may encounter on a daily basis. The question of apparent motion’s relation to real motion has not yet been fully resolved, although most agree that both types of motion follow the same visual processing pathway and this accounts for our inability to distinguish the two. Even when higher cognitive functions activate our knowledge that there is no actual movement (as when, for instance, we look at the waterfall illusion in a classroom setting, privy to the fact that the display is completely stationary) we cannot help perceiving motion. Perceiving such illusory motion depends on processes that are “cognitively impenetrable: belief doesn’t make any difference to the way the illusory phenomenon looks” (Currie 334). This would explain why apparent motion is so persuasive and unshakeable. The waterfall phenomenon indicates thus that, to the visual system, illusory motion is virtually indistinguishable from the continuous motion of the world. For more information on short range}
moves on the screen during a film—cinematic movement is subject to the same perceptual transformations as real motion, and as such results in the very same experience. If in fact Anderson and Anderson’s assertion that the human eye seemingly “cannot distinguish between short-range apparent motion and real motion” and their conclusion that “to the visual system the motion in the motion picture is real motion” is true, cinematic vision can claim, more than ever before, a true perceptual equivalence with human vision. This conclusion bears considerable weight on our understanding not only of the cinematic apparatus but of perceptual processes as well; and in claiming such veracity for the camera-eye, calls for a radical revision of much film theory.

This assertion would in fact seem to challenge analyses of the cinema as a fundamentally artificial representation of the world, and would require that theorists as established as Christian Metz reconsider their oeuvre entirely to label the cinema not a ‘re-presentation,’ but truly a presentation (Anderson & Anderson). More importantly, accusations against the cinema’s trickery become irrelevant to any discussion of the medium, since the processes of the visual system transform this non-motion into an experience of actual motion; and to our eye, this movement is as real as it can be.

Indeed, in “Film, Reality, and Illusion” Gregory Currie stresses the need for a re-interpretation of motion in film theory as well as science. Rejecting the claim that the cinema is the ultimate illusion, he adopts instead a perceptual realist position and argues that films engage our visual system, in many respects, in exactly the same way that a real scene might. The two visual ‘processes’ are comparable insofar as they judge the “spatial and temporal relations between objects and events” (328) by the same mechanisms, and

apparent motion and its instantiation in cases of illusion, see the relevant section in Stephen E. Palmer’s Vision Science (Chapter 10, pp. 473-480).
produce the same effect on the viewer. Objectivity, or independence, of the qualities of perception from a subjective point of view should not, in his opinion, determine the veracity of a percept. In other words, the notion that apparent motion is observer-dependent and thus collapses in the absence of a viewer—like the paradigm of the tree in the forest—should have no consequence on the status of the image as ‘true’. Citing color as an example of a secondary, response-dependent but nonetheless real property of objects, Currie claims that the error of science (and much of film theory) lies precisely in thinking that a full description of the world is possible without consideration of subjective points of view. As a result, he concludes that though light, color, and motion on the screen may require the interpretation of a human visual system in order to exist, we should not deem them any less real than their worldly counterparts—especially when we consider that color perception in the real world may also largely be a matter of interpretation, as phenomena like color constancy suggest.\footnote{The phenomenon of chromatic color constancy is the ability to see the surfaces of objects as the same color despite large changes in illumination—or, as Stephen Palmer explains (in Gibsonian terms) “the perception of invariant properties of a surface’s spectral reflectance despite changes in illumination and viewing conditions” (133). A Granny Smith apple, for example, will look green to us whether we see it in sunlight or under the store’s fluorescent lighting, and even in dim light. Though we perceive ‘greenness’ in all of these cases, the wavelength information from each kind of lighting condition conveys very different data to the eye. This means that we do not perceive colors merely as a function of wavelengths of light, but that the brain must be figuring out something else in order to ‘extract’ the same reflectance throughout different lighting conditions. This ‘something else’ involves determining the wavelength of the source light so that the ‘true’ reflectance can be recovered (in other words, the illuminating light must be computed and discounted in order to obtain only the wavelengths of light reflected by the object). The brain’s involvement in this process suggests that color is not a physical property of objects, but rather a psychological property of visual experiences; a process that involves ‘interpretations’ by the visual system of the context surrounding an object.} It is significant to note that in Currie’s thought, the camera aligns further with human vision as a result of its dependence on subjectivity; unlike Bazin, he sees the instantiation of a human mind, with all the perceptual and emotional ‘baggage’ that this involvement may carry, as a closer approximation of the camera to the eye.
Following a similar line of thought, David Bordwell suggests that cinema’s perceptual reality is contingent upon different types of visual effects. These divide roughly into culturally specific effects, which require learning (i.e. conventions such as shot/countershot, fades, and dissolves) and universal effects, which remain stable across spectators because they presumably tap hard-wired processes. Examples of the latter kind include apparent motion, high contrasts in visual tonality, the effect of a sudden or unexpected intrusion of an object into the frame, and possibly the manipulation of lighting to create varying textures and volumes on the screen. Such “sensory triggers” (Convention 93) affect viewers the same regardless of their familiarity with film, because they correspond with stimuli in the world.

In light of these findings, the putative correlations between cinematic vision and human perception acquire an incomparable degree of reality, derived both from perceptual verisimilitude (i.e., the appearance of truth) and actual conformity to the makeup of our visual system. With the cinema’s potential for perceptual accuracy established and the eye-camera analogy corroborated, we may now analyze how the metaphor is instantiated in films. But before we venture into the practice of cinematic vision, a review of some of the discrepancies between eye and camera is in order.

If Gibson presents some of the most convincing evidence for the validity of the analogy, he also provides compelling reasons for its insufficiency. The foundational distinction between eye and camera, and that which accounts for all subsequent differences between them, is the fact that the moving image results from an alteration of a pre-existing surface, and thus much information is lost, degraded, or transformed. Some of the differences he enumerates are: (1) Angle of view, or the fact that photographic representation has a very narrow field of view and therefore no peripheral vision. As a
result, one only sees a limited portion of the scene, namely the center, and misses its surroundings. This narrowness necessarily circumscribes vision, preventing us from looking ‘out of the corner’ of our eyes (except to see the room we are in, but never the periphery of the scene); (2) Picture margins (framing), the artificial coordinate frame resulting from a conventional rectangular frame around the image. Because the frame is aligned with the vertical and horizontal orientations of the exhibition space, any deviation from the frame will cause the image to appear askew. Any attempt to show the place of the observer himself within the space of the screen (i.e., locomotion) must take this obstacle into account; (3) Weak sense of orientation, or lack of flexible vision in the cinema, presumably results from a lack of clear indication of spatial position. While our eyes can move in any direction and observe from any position and still perceive the world as upright (because of information gained through posture of the head and eyes), film lacks such spatial stability. An artist shooting a large building from his point of view may fail to convey the sense of ‘looking up’, and render the overall image awkward or unstable; (4) Limited ‘scanning’ ability and visual range, the inability of the camera to shift views rapidly and frequently without resulting in a blurred image. Our eyes can shift swiftly from one point of fixation to the next, through saccadic eye movements, while retaining a sharp, stable, and continuous image. Even with pans, tilts, and dolly shots the full experience of visual scanning cannot be replicated in film; (5) Absence of central focus, limited capacity to concentrate attention on a particular part of the scene. In the human eye acuity is best at the center of vision, or fovea, and decreases at farther angles so that vision gradually fades at the periphery. In film, the viewer can choose to focus on any part of the scene just as well as in the center, and the only way to command attention to a particular section of an object is through the close-up (Motion Picture 174-178).
Motion, the bedrock of Gibson’s perceptual theory, may translate into film; but its information is at best degraded, and cannot wholly replace the amount of knowledge gained from the world through our physical movement within it. In addition to the above list, Gibson emphatically denounces the motion picture as a weak substitute for real perception because it lacks data from proprioception (except for eye movements), and because ultimately the motion experienced in film is not experienced first-hand by the observer:

[The modern motion picture] is still mere illusion. The perceiver is passive. He sits in a chair. He is not fully surrounded by the environment represented on the screen. He cannot alter what will happen in the virtual world (...) most of it is imposed, not obtained. The perception of a real world cannot and never will be completely imitated, for in the real world the perceiver can always find out things for himself and he more he explores the more he will find (The Senses Considered 317).

By this account film fails to do justice to human vision because it lacks some of its essential practical qualities. On a broader and more theoretical level, Gibson’s theory of perception undercuts the validity of the camera-eye analogy by refuting any metaphysical connection between the two. He attacks the root of the analogy by declaring the retinal image to be a fiction, thence precluding any comparison to the image formed by the camera. There is no such thing as a picture ‘painted’ at the back of our eye, as Newton led us to believe, and the eye cannot produce a visible image akin to that produced through photographic technology. Fundamentally, the camera as a device for reproduction can preserve an image and later make it available, in a way that the human eye cannot—if this were the case, Gibson claims, there would need to be a small man
within the brain to look at the image projected onto the retina, a man who would also
need an eye through which to look at this image. Thus we fall captive to a circular logic,
which requires an infinite number of little-men-within-the-brain (homunculi) to observe
our retinal images. Insofar as the analogy suggests that the eye works like the camera—
as an imaging device that projects external objects onto our field of view—it is
misleading. Gibson suggests (in opposition to Helmholtz) that the visual system works by
actively gathering information about objects through the eye, rather than through sense
impressions passively made on the eye (The Senses Considered 226).

Working in the same period as Gibson, but within a different discipline, critic
Rudolf Arnheim takes a similar position to Gibson, though with entirely different
motivations. In his 1957 Film as Art, Arnheim examines the differences between human
perception and cinematic vision. His personal investment in the matter stems from the
idea that if the camera “does nothing but reproduce reality mechanically” (312) then it
fails as an artistic practice. In order to salvage the artistic quality of film, Arnheim deems
necessary a delineation of ways in which the camera falls short of reproducing the world:
“people who contemptuously refer to the camera as an automatic recording machine must
be made to realize that even in the simplest photographic reproduction of a perfectly
simple object, a feeling for its nature is required which is quite beyond any mechanical
operation” (313). Two important sources of divergence are reduction of depth and
absence of non-visual modalities or senses. Simply put, depth perception arises from the
fusion of two overlapping retinal ‘images’, a fusion which does not occur in film simply
because both eyes are receiving the exact same image from the exact same position—
there is no difference between the two retinal images. As a result, film depth is
significantly inferior to depth perceived in the real world. A related effect is the loss of
size and shape constancy, the ability of our system to preserve the relative size and shape of objects even as they appear dramatically different in the retinal image.\textsuperscript{13} The second crucial distinction between the two types of seeing involves the absence of auditory, olfactory, and other sensory input from the film experience. Arnheim argues that the cinema can—and should—dispense of all other senses because the visual modality alone can suggest all other types of input (i.e., when the sound of a shot is suggested by a sudden rise of a bird flock). In our physical interactions with the world, visual perception is inseparable from all other percepts, but in film vision alone suffices in conveying the essence of a scene.

Analyses like these, which aim to make clear the abyss between the types of vision that each system makes possible, abound both from artistic and scientific perspectives. Because of the similarity in content across many of these accounts, only one more position deserves to be mentioned for the purposes of this discussion. Perceptual psychologist James E. Cutting points out that films are not like the real world at all in many ways. Specifically, these differ from our normal perception in matters of space and time. The fact that we accept such limited and distorted representations of these variables suggests not so much that film completely meshes with our visual system (though he offers reasons for how it does) but that our system has much more plasticity than we had considered. In other words, we do not necessarily perceive the world according to its structure, and there is much leeway in how we interpret such a structure. Though he

\textsuperscript{13} As a useful example of size constancy, consider the following common situation. When we take a photograph of a person laying with feet stretched out before us, these will appear abnormally large in relation to the head, and will take up most of the frame. Conversely, were we to see this person laying out under normal conditions (i.e., in the real world) the feet would appear proportionate to the body. The ability to preserve relative size, or achieve size constancy, is unique to perception in the real world and is absent from the motion picture.
enumerates ways in which 'Hollywood style' (classical film aesthetic) meshes with the human visual system in order to conceal manipulations of camera, lighting, and editing—namely that it makes use and preserves those visual cues (occlusion, height in visual field, relative size, and so on) present in the visual world—he concludes that films still fall short of approximating actual conditions of vision, and attributes its persuasive powers to the flexibility of our system rather than to actual correlation between both types of vision (9).

What are we to make of such claims against the adequacy of cinematic vision? Gibson's thorough and irrefutable list of discrepancies between eye and camera begs that we reconsider seemingly neat correlations between them, and recognize what the eye can do that the camera cannot capture. But if these claims challenge the 'accuracy' of vision through film, they also define what the cinema can do that the eye cannot. Indeed, as Arnheim claims in the above quotations, these discrepancies alone account for the artistry of film. Arnheim and other theorists that celebrate film as art essentially wish to revert the hierarchical relation between eye as model and camera as imitator, and allow the eye to learn from the camera. For those who think like Arnheim, the points at which cinematic vision veers from our perception of the physical world become the locus of artistic value. The camera does indeed have a 'privileged relation to the real', as Bazin said; and that relation is defined at once by a close proximity to, and strong divergence from, human vision. The particular balance between proximity and divergence defines the medium of film. If the motion picture bore no relation to our experience of vision, it would disinherit a large part of its epistemological appeal, its ability to convey knowledge about our physical world. On the contrary, were the camera to work and feel just like perception, why have the cinema at all? Where would we locate value in a
machine that could simply repeat what we constantly experience, minus the emotions and thoughts of the feeling person? Thus, Arnheim and his cohorts claim that the cinema can stand on its own, as an entity germane to, but separate from, the workings of visual perception.

Perhaps the strongest instantiation of Arnheim's reversed hierarchy lies in the bulk of film produced between the 1920s and '30s within the avant-garde movement in Europe, particularly in France and the Soviet Union. Prefiguring Bazin's description of cinema by four decades, these artists pronounced the camera to be superior to the human eye for its ability to better (i.e., more objectively) represent the visual world. They ascribed greater objectivity to cinematic vision because it was not "weighted down by likings and dislikings, by habits and considerations," (Wees 8) or bound by the limits of human vision. The camera can overcome these limits and see what the eye can't see—perceive objects at night, zoom into scenes without approaching them, juxtapose different times and places, break down a rainbow into a prism and movement into single frames (thus revealing kinetic processes, much like Eadweard Muybridge was able to do), and so on. The idea that the camera could augment vision gained currency in France through the work of Fernand Leger, Man Ray, Jean Cocteau, Jean Epstein, Salvador Dali and Luis Buñuel, among others. Rejecting the metaphor of eye and camera as a simple case of isomorphism, these artists praised the camera's unequaled epistemological potential, derived from its detached, objective relation to the physical world. The camera can show us what the world truly looks like, divested of emotional biases and errors of sight. It allows for direct acquaintance with one's own knowledge, the ability to know, as Jean Epstein claimed, the self's experience "immediately and incorrigibly" (Turvey 27). If these artists' predilection is implicit in their fixation with ocular imagery (all of the artists
mentioned above feature the eye prominently in their films, not only as subject of vision but its as *object*) and the kind of reflexive seeing that the camera makes possible, the films and writings of Soviet filmmaker Dziga Vertov explicitly commend the camera as a superior eye:

I am eye. I take the most agile hands of one, the fastest and the most graceful legs of another, from a third person I take the handsomest and the most expressive head, and, by editing, I create an entirely new perfect man… I am mechanical eye.¹⁴ I, a machine, am showing you a world, the likes of which only I can see… My road is toward the creation of a fresh perception of the world. Thus, I decipher in a new way the world unknown to you (*The Writings of Dziga Vertov* 358-359).

This ‘new’ way of seeing the familiar world is not only different than our normal perception, but perfected, heightened, more truthful. Vertov’s preoccupation with film’s acute ability to reveal the conditions of daily life is expressed in his ideal of the Kino-Eye. This concept posits the cinema as an instrument of vision that can capture fragments of reality in a way that the naked eye cannot. Vertov celebrates the Kino-Eye as a means of making “the invisible visible, the obscure clear, the hidden obvious, the disguised exposed, and acting not acting” (362). Thus, the camera has a double function of uncovering and expanding, revealing things for the first time (in the case of Eadweard Muybridge and his motion experiments) and providing new ways of seeing familiar scenes (as when candid shots draw our attention to things we usually ignore in our interactions with that environment).

¹⁴ This quotation clearly illustrates Vertov’s ideal of the fusion of photographic technology with the human body, to create a new kind of vision. Indeed, it was this longing for a synthetic being that led him to change his name from his original Denis Abramovich Kaufman to Dziga Vertov, meaning ‘spinning top.’ The nickname refers to a dynamic, mechanized eye that can reveal multiple—and simultaneous—perspectives of the world (an image which suggests a strong Futurist influence).
The role of the cinema is thus twofold. On the one hand, its affinity with the physical world and the objectivity of its mechanism allows it to show scenes cleansed of personal biases, the purest representation of our world. On the other hand, the crucial differences between this technology and the visual system allow it to move beyond purification and reveal things outside the scope of our physical experiences—the camera defies space and time, and can reassemble the world as its operator sees fit. Here we see a synthesis of Bazin’s ideal of purification and Arnheim’s promotion of the creative use of film’s “defects”, or divergences from reality, as the vocation of the cinema. These two trends map directly onto the two functions of the cinema delineated above in the discussion of Vertov: Bazin supports the first role, the creation of an objective, unpolluted view of the world, and Arnheim aligns with the second function, that of exploiting the camera’s unique technology to reveal what the naked eye cannot see.

In this period of exalted praise for cinematic vision, the camera-eye model veers from a one-to-one correspondence and posits the camera as the more appropriate vessel for vision. The camera, according to this new paradigm, facilitates ‘meta-vision’, a kind of seeing that constantly reflects on its own seeing by virtue of the many divergences from the visual system. Vertov’s *Man with a Movie Camera*, for instance, exploited every possible deviation from normal perception in order to foreground the different kind of seeing that the cinema made possible, in the hopes of ridding his viewers of complacency and making them aware of their own act of vision.\(^{15}\) Thus, cinematic vision becomes defined as an epistemological act, that in making us aware of a new kind of perception,

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\(^{15}\) Vertov’s frequent use of stop motion, freeze frames, extreme angles, and other cinematic techniques can be seen as a way to call attention to the differences between normal perception and cinematic vision; indeed, a famous scene in *Man with a Movie Camera* shows a peasant, an urban worker, and a film editor hard at work, suggesting that filmmaking is just a job like any other—that there is much effort behind the images we see. Such a degree of reflexivity is crucial to Vertov’s project, because it stands in stark contrast
offers more truth than unmediated vision. As Rosalind Krauss claims, such modernist films capture the act of vision "in its reflexive form: the terms not just of seeing but of consciousness accounting for the fact of its seeing. It is the axis of a redoubled vision: of a seeing and a knowing that one sees, a kind of cogito of vision" (Turvey 31). This idea of a redoubled vision, a heightened awareness of our surroundings as well how we encounter them visually, forms the basis of the visual revolution instigated by the American avant-garde in the early 1940s.

In particular, the notion that the cinema (more so than any other form of communication) can make us reflect on our own vision and thus reveal the familiar in a new light gains most force in the work of American avant-garde filmmaker Stan Brakhage. An ardent supporter of the motion picture camera, Brakhage claimed that the cinema offered the only means toward complete visual awareness, that is, consciousness of how we encounter the world rather than simply what we see in it. Additionally, Brakhage fought for an expanded visual consciousness which included not only functional or 'normal' vision—the kind of seeing necessary to navigate the world—but also the many variations of sight, from hypnagogic phenomena (dreams, hallucinations) to illusions (spots, afterimages), as well as deteriorated vision (partial blindness, cataracts, or nocturnal vision). At this point in the discussion we turn to Brakhage to examine the function of the eye-camera model in recent film practice, and assess the viability of cinematic vision as avatar of truth.

to the complacency that the Institutional Mode of Representation (or classical Hollywood structure) furthered among audiences. Vertov seeks to undermine this mode and instead create films that force the viewer to constantly reflect on the fact that he is watching, carefully observing, through a mechanism very different to the perception accessible through the human visual system.
IV. The Camera-Eye in the American Avant-Garde: The Case of Stan Brakhage

The artist has carried the tradition of visual and visualization down through the ages. In the present time a very few have continued the process of visual perception in its deepest sense and transformed their inspirations into cinematic experiences.

Stan Brakhage, *Metaphors on Vision* (13)

Undevelopment is what’s needed, from positive, to negative to some unexposed original.

Stan Brakhage, *Camera-Eye—My Eye* (23)

I began this discussion with two conflicting takes on the camera’s relation to the physical world. While Bazin’s camp conceives of the camera as an arbiter of truth, better equipped than our own visual system to discern between certainty and illusion (or preconception), Brakhage allocates a special place for the quirks of sight that Bazin discards, and locates ‘truth’ or authenticity in the camera’s ability to represent this idiosyncratic vision. Brakhage’s filmmaking career spanned more than five decades, and culminated in an oeuvre of approximately four hundred works. Over the course of many years, Brakhage’s formidable project evolved from an ad hoc, adolescent gesture (*Desistfilm* [1954], which Brakhage described as originating from ‘beatnik nerves’) to a full-fledged campaign against the so-called ‘objective’ vision advocated by Bazin’s cohorts.

Brakhage’s manifold campaign operates on several aspirations, all of which underscore a revisionist impulse with regard to both perceptual theories and film practice. His work attempts to supplement scientific theories of vision where they fail to account for the intuitive experience of certain phenomena (e.g., color perception), and redress the limited and inaccurate experience of vision offered by commercial cinema. Brakhage
condemns the dominant industry (presumably Hollywood)\textsuperscript{16} for its creation of artificial conditions of seeing, a utopian environment which humans rarely encounter in the world. Even, diffuse lighting; sharp, clear focus across the screen; continuity or ‘invisible’ editing; standard lenses which emphasize linear perspective and flatten space; stable shots and smooth pans; stock colors; and the effacement of any record of these manipulations, comprise a common list of grievances against the mainstream film. Such techniques, according to Brakhage, sacrifice perceptual accuracy in the name of narrative, and thus reduce the cinema—and human perception—to a vehicle for storytelling. Here we see the crucial difference between D.W. Griffith’s and Brakhage’s desire to make people ‘see’. Griffith wishes to bequeath his particular understanding of history through the narrative, aided by the illustrative effect of cinematic images. Brakhage, on the other hand, uses vision not in service to, but as the very subject and object of, his work. His films are didactic exercises in vision, which aim to teach people how they perceive the world.

Albeit somewhat schematically, Brakhage’s monumental programme bisects into two overarching goals: it seeks to \textit{reveal} vision, by showing that a fuller understanding of the physiology and phenomenology of perception is available to us, and made possible through his cinema; and to \textit{expand} vision, by including alternative kinds of seeing that

\textsuperscript{16} While Brakhage does not always specify a particular kind of cinema, it is safe to assume that in most cases the object of his criticism is the Hollywood industry, based on suggestive comments dispersed throughout his body of texts. In \textit{The Camera Eye} he condemns film’s preoccupation with knowledge, and its use of the visual in service of matters outside the visual domain. Citing Muybridge’s stake in Stanford’s bet regarding a horse’s galloping movement (and whether all hooves were ever lifted off the ground), Brakhage claims that Hollywood is “still racing after the horse,” that is, still attempting to capture information about the physical world and furthering a stagnant, if not futile, practice of contrived realism (22). Specifically, his accusation against Hollywood is that, unlike Muybridge and the ‘documentary’ tradition that followed his example, commercial cinemas use this ‘natural perception’ in service of something else, i.e., the narrative. Rather than seek realism for its own sake, as Muybridge may have done, and as many such documentary or ‘scientific’ impulses may attempt, Hollywood’s contrived or fictional realism only functions as a backdrop to stories.
are left out of the dominant perceptual discourse, both in science and film. Examples of these peripheral visions are semi-blindness, ‘closed-eye’ vision (such as afterimages, dreams), drug-induced phenomena, and even perception from a child and insect’s point of view. While both of these goals certainly overlap, and may often seem synonymous with each other, I propose a significant qualitative distinction between these two impulses. I conceive of the latter aspiration as an ideological exercise, a social strategy for the inclusion of marginalized or underrepresented forms of vision. The expansion is symbolic, gestural, and functions only at the theoretical level. That is, in showing us the perception of an insect, Brakhage does not expect that we really learn to see like that insect, but rather that we realize that other types of vision exist; and that through this realization we may reflect on other kinds of vision. Insect vision in this case is emblematic, suggestive of the knowledge that alternative visions are possible.

In the cases where Brakhage reveals or exposes vision, he means to convey knowledge how or about this vision; he intends for us to take this experience of cinematic perception at face value and not as a stand-in for his ideology. What Brakhage attempts to do within this paradigm is to ‘visualize’ or represent vision itself, to make the ‘what’s-it-likeness’ of seeing available to the viewer on the screen. Because I am interested in how well the cinematic medium can represent human vision, the remainder of this discussion will greatly focus on this particular will to reveal vision, and less so on the ambition to expand.

The fundament for Brakhage’s cinematic treatise on vision appears most clearly in his landmark essay Metaphors on Vision, first published in 1963. Rhetorically, this manifesto stands as a paradigm of Romantic ideals, a passionate quest for imagination, intuition, and subjectivity through vision. The opening lines read,
Imagine an eye unruly by man-made laws of perspective, an eye unprejudiced by compositional logic, an eye which does not respond to the name of everything but which must know each object encountered in life through an adventure of perception [italics mine] (12).

Brakhage’s terminology suggests an insurgent attitude toward dominant forms of visual communication, which he accuses of circumscribing the wide range of perceptual experiences in the name of clarity and rationality. Terms like ‘unruled’ and ‘unprejudiced’ bear the marks of an anti-imperialist rhetoric, and indeed support Brakhage’s attempt to ‘liberate’ the eye from the primacy of reason. His Romantic view of the perceptual adventure as a full immersion within the visual modality, without the interference of any logic or semantic coherence, finds its antithesis in commercial cinema. Brakhage’s vitriolic dislike for the conventions of such films hinges on two main tenets of the classical film industry: that the viewer recognize the image as an equivalent to normal, functional vision (a correspondence achieved by the ‘optimal’ conditions of seeing described above), and that this alignment serve to further the narrative content of the film. In the first case, Brakhage condemns the construction of a perfectly clear, stable world which attempts to convey an ‘objective’ picture (much like a Renaissance perspective painting) that can be universally accepted as reality. This representation of the world, Brakhage argues, prioritizes cognitive understanding and conceptual communication—Griffith’s brand of ‘seeing’—over the lyrical possibilities of the medium: its ability to reveal much about our personal, ineffable experiences of vision.

Aside from a limiting treatment of the image, Brakhage locates the fault of cinema in its reliance on language and narrative. Against this second mainstay of classical cinema, Brakhage attempts to restore the visual primacy of the medium by
eschewing any non-visual form of thought or sensation. Only by obscuring functional vision and eliminating language from the image can one successfully utilize the cinema for an ‘adventure of perception’. In this cinematic adventure, unfettered by reason or knowledge, one can become aware of a seeing much truer to our experience than commercial cinema—and even our own everyday vision—can ever reveal. Indeed, Brakhage claims that “there is a pursuit of knowledge foreign to language and founded upon visual communication, demanding a development of the optical mind, and dependent upon perception in the original and deepest sense of the word.” This panegyric for an ‘original’ perception recurs throughout his writings, and marks his desire to make the eye, rather than the brain, the center of human knowledge—the eye and the brain here representing the subjective sensations and rational percepts of our experience, respectively. The trope of the ‘optical mind’ suggests a kind of meta-vision, a kind of seeing that constantly reflects on itself in the search for heightened knowledge.

So how is this purely visual knowledge-seeking system put to practice in Brakhage’s films?

Before we turn to the strategies through which Brakhage attempts to implement an optical mode of thought—what he terms moving visual thinking—we might consider how much of his particular ‘pursuit of knowledge’ can actually be ‘foreign to language.’ Brakhage consistently demands that film act on a viewer’s perceptual, and not verbal, capacities. He insists that the image work on its own without any reliance on words—no sound, no dialogue, no narrative, and no semantic understanding of the images presented:

My eye again, outwards (without words) dealing with these ‘indescribable,’ ‘imaginary’ vibrations, producing the categorized colors...an irresponsible gamble thwarting the trained response link between retina and brain, breaking
the associational chain (...) giving the eye’s mind a chance for change...[italics mine] (My Eye 29).

For Brakhage, ‘words’ are inextricably linked with a rational understanding of the image, brought about by processes of recognition and categorization of objects. Words (whether in auditory, visual, or ‘conceptual’ form) presumably condition our responses to the image, by predisposing us to perceive its contents as particular objects in a particular relation to each other. Ridding the image of any verbal vestiges can lead to the optical communication he seeks. But for someone who claims such primacy for vision, Brakhage seems to rely an awful lot on language to make his images intelligible. This paradoxical dependence on language plays out in three primary ways.

On a diegetic level, we could say that his films require a high degree of analytical thought regardless of (or perhaps precisely because of) their abstraction from clear representations of scenes. Thus, while he may want to ‘thwart’ the ‘trained response link between retina and brain’ by making his images hard to conceptualize (i.e., match them to things we would normally encounter in the physical world and thus understand what they represent), a complete dissociation between perception and rational thought may prove impossible for any kind of cinema. Though Brakhage’s films do not explicitly foreground a narrative or story, they tell something about a particular experience in the world—and that something is what the viewer will try to understand in his engagement with the film. Indeed, viewers will likely find themselves trying to identify the sources of his abstract color patches, or at the very least deciphering how these images have been created. Because Brakhage seems to equate the word, or more generally language, with any such deciphering, or rational thinking—and I argue that his films demand, perhaps
more emphatically than narrative cinema, precisely such rational thinking—I suggest that his abstracted images contradict his ideal of the ‘optical mind.’

A full analysis of this paradoxical case would require a digression into the nature of thought and the relationship of language to perception—aspects of cognition which lie outside the scope of this paper. But insofar as Brakhage considers language and reason to be equivalent, we can say that our use of ‘reason’ to understand his images may suggest a concomitant use of language. If this objection to Brakhage seems questionable, we may turn to a more indisputable use of language within the diegesis.

Brakhage makes use of language explicitly in his films, in the form of words that appear on the screen (often isolated descriptors of objects present in the recorded scene), and also in the illustrative role he ascribes to his titles. Titles play an important, if not necessary, part in our understanding of the films. By opening each film with an explicit title phrase such as “Window Water Baby Moving,” before presenting precisely such a scene, Brakhage is essentially priming the viewer for what appears in the image. Similarly, the phrase “Mothlight” cues the viewer in to the fact that the material ‘film’ in this case is made up of moth wings—and that this work literally shows us light passing through a moth. Such emphasis on the meaning of words subverts his predilection for the image and betrays an underlying interest in language. Indeed, his reliance on titles for our understanding of the films suggests that only language can make his abstract images intelligible.

But perhaps the largest contradiction in Brakhage’s work lies outside the films themselves, in their critical explanation. As the most prolific avant-garde filmmaker, and the one most explicitly concerned with the experience of unmediated vision, Brakhage is also the most widely published of his cohorts. He attempted to exert full control over the
interpretation of his work, and indeed his many manifestoes and articles prescribe the way to ‘see’ his films. Because his written work is so rich and even necessary for a solid grasp on his films, it seems inseparable from his visual ruminations. It might even be safe to say that Brakhage has been just as influential a writer as he was an artist! His most famous work, *Metaphors on Vision*, makes frequent appearances in scholarly texts as a work in its own right, rather than mere accompaniment to his films.

In similar terms, the fact that his visual work is too esoteric for most—at least as a representation of perception—means that a large part of his audience is made up of those who are privy to his writings, often academics. So although he attempts to create a visual revolution, those who can understand his work are not only the highly literate, but also the highly erudite. If Brakhage’s work requires interpretation, the locus of analysis may be in the verbal rather than the visual realm.

How, then, can Brakhage achieve a purely visual knowledge-seeking system, when it appears that language plays a significant role in his work?

While it may seem that the aspects of language just discussed compromise his goal of the ‘optical mind’, his use of language need not preclude a successful *emphasis* on vision. Even if his pursuit of vision is not completely ‘foreign to language,’ it still holds visual perception as its subject. To determine the plausibility of his goal, we must take a look at the strategies employed in his films in order to foreground the experience of vision over the act of reason. Now we can return to the question posed earlier: how is Brakhage’s ‘optical mind’ put to practice in film? As I mentioned before, by abstracting from any non-visual stimulus (i.e., sound) and from what we’ve termed functional vision, Brakhage wants to impede intervention by cognitive faculties. In this conceptual limbo that he envisions, it becomes possible to gain insight into our own vision by focusing on
both how we really see and what we really see. Let us then deal with Brakhage’s twofold visualization strategy, by looking first at the way in which his knowledge of the physiology of vision (the ‘how’) conditions his representation of visual processes; and then at the way in which the visual image (the ‘what’) in his films differs from functional vision, as well as that institutionalized by the cinema.

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The filmmaker’s medium is less … film than it is sight. Indeed, at [his] most rigorous, [the] filmmaker practice[s] a phenomenology of vision.

—Vivian Sobchack, The Address of the Eye (91)

The tragedy of the cinema for Brakhage is that it has been squandered, its power misused, its purpose misunderstood. As utilized by commercial cinema, he laments, cinematic vision conveys nothing about vision itself. He considers the practice of film stagnant both as art and as a source of knowledge, almost obsolete as an imaging device, and creatively bankrupt. To be sure, Brakhage believes that the cinema exhibits a portentous capacity to convey reality— but this capacity remains only a potential inasmuch as the image reflects a reality extraneous to the physical experience of seeing. In other words, the cinema succeeds only when it addresses itself to the eye, taking the visual system as its only audience, reciprocating its attention; so that watching a film becomes a dialogue about seeing. Describing the state of the contemporary cinema in the 1960s, Brakhage writes of an unborn potential, muffled by classical conventions, that will only emerge when we ‘abort’ the cinema heretofore practiced and compose images that are “of value only to the anatomical eye” (36). Indeed, as Sobchack asserts above, film betrays itself when it functions as anything other than a study on vision. In this economy,
filmmakers captivated by the allure of sound and narrative, and anything generally extraneous to the essence of sight, participate in the perversion of the medium. (As I will later suggest, such a strict view of film’s responsibility may compromise the medium’s potential—and I will argue that at its best, the cinema encompasses many different practices—from the introspection that focuses on vision itself, to the exteriorization of our encounters with the physical world).

One way of addressing the eye directly is to appropriate its own behavior, so that cinematic vision becomes isomorphic with perception. A full revision of the industrial paradigm of the cinema requires that we redress misconceived notions of how vision occurs, first and foremost. One of Brakhage’s main qualms against Hollywood17 is that its accepted conventions belie the physiological reality of perception.18 In many interviews, and in his own writings, Brakhage bemoans Hollywood’s use of pans, tilts, and smooth zooms to effect a clear, stable, and solid representation of the moving world. In opposition to this falsified, idealized representation, Brakhage suggests that the camera reveal the ocular movements by which we see the world. His films, particularly Cat’s

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17 As aforementioned, ‘Hollywood’ is used as a representative of the tradition that Brakhage criticizes, and not as the exclusive target of his project.
18 In my analysis of Brakhage I want to make a clear distinction between the physiology and phenomenology of vision, and the camera’s ability to address these different aspects of our perception. When I speak of physiology, I am referring specifically to the functions and processes that make vision possible—the mechanism by which we perceive the world. In other words, this aspect of vision has a physical foundation or neural basis, and is for the most part ascertainable by science (for instance, the activity of rods and cones in our retina and the processes they instigate). Phenomenology can perhaps be understood as the output of physiology, what we experience as a result of these processes—thus, complex activity by rods and cones may result in a particular experience of color. The process and experience of vision therefore remain separate, as the earlier example of chromatic color constancy suggests. Presumably, when Brakhage refers to a cinema which is only of use to the ‘anatomical eye’, he is referring to the physical mechanism (physiology) of vision, though strictly speaking anatomy would only encompass the structure of the eye and the function of its different parts. By adopting this term, however, Brakhage makes clear his attempt to address the way the eye ‘really’ works, as opposed to representations (such as mainstream cinema) that do not respect the eye’s structure and mechanism. In this discussion I argue that Brakhage’s fixation on such a faithful adherence to the physiology (or anatomy, which he seems to equate with physiology) of sight leads him to sacrifice fidelity to the phenomenology of vision.
Cradle (1959), Anticipation of the Night (1962), and Window Water Baby Moving (1962), among others, use both editing and camera movement to mimic the frequent saccades through which our eyes intermittently sample the environment. In the latter example, rapid and frequent jump cuts preclude any sense of continuity between each image, so that objects appear spatially and temporally disconnected as they (presumably, for Brakhage) appear to our system. Thus, a static shot of a window gives way very suddenly, through a jump cut, to jerky images of a woman in labor, to be replaced seconds later by black frames—and then another shot of the static window. The woman’s position in relation to the window remains murky, for we can only catch minuscule, intermittent glimpses of individual elements of the scene.

Rejecting Hollywood’s sacred ‘continuity’ or ‘invisible’ aesthetic, where editing often serves to smoothly transition from shot to shot and generate a fluid, unified representation of space in the viewer’s mind, Brakhage finds higher truth in cuts that simulate the gaps in sight that occur with each saccade when we search a given scene. Preceded by an extended shot of black, each image reveals anew a small part of this scene, much like our system gathers ‘snippets’ of the world at each new fixation of the eye. Speaking to a proxy cameraman, Brakhage asks him to simulate what a real ‘pan’ looks like to the human visual system:

If you would make a smooth pan with the camera...The eyes can’t really see that way. To move one’s eyes steadily across the room to make a pan—it’s the impossible. You’d have to move the zoom lens very swiftly and extremely, jerk it back and forth, picking up bits and fragments of information...

(Brakhage interview transcript)
Such swift and extreme camera movement, compounded with the jump cut, captures the small caesuras in vision that Hollywood’s images gloss over. Under the auspices of such strategies, Brakhage claims a doubled realism, or hyper-realism, where the camera does not attempt to smooth over these gaps but indeed flaunt them as an intrinsic part of our visual experience.

But does this movement really constitute a part of our experience? Brakhage admits that his jerky images will not look to viewers “the way they think they see” (Brakhage), but argues that the formal qualities of his films faithfully replicate perception. Yet, the way people ‘think’ they see is synonymous with experience, the very aspect of vision his films seek to capture. The problem with his intention, then, lies in confounding the neural basis and mechanism of vision with the subjective experience of it—or, to return to the terms defined earlier, in his failure to distinguish the physiology of vision from its phenomenology. While he correctly observes that the pan presents a fluidity of vision not possible through the eye rotation/head movement that its tracking motion suggests, he fails to make a distinction between the eye’s movements and their effect on the perceiving subject. How would we perceive a stable world if we were consciously aware of eye movements? Indeed, our eyes move all the time with tiny involuntary impulses, called physiological nystagmus (caused by ocular muscle tremors).

But more apropos Brakhage’s project, two important types of eye movement are saccades and smooth pursuit movements. I want to argue that Brakhage’s confused visual foundation stems from (1) ignorance of the mechanisms that make perception of a stable world possible, and (2) a conflation in his theory of these two completely different kinds of movement.
Saccadic movements are rapid, sudden eye movements which present the eye with new information, and occur when we observe a stationary scene. Visual perception can occur between these saccades because the eye retains or ‘fixates’ a particular object for a limited period of time, enabling visual processing. Again, the question arises as to how we fail to perceive the motion of stationary objects as they sweep across our retinas, a phenomenon known as egocentric position constancy. A few reasons account for our smooth perception of the world despite saccades: firstly, as perceptual scientist Stephen Palmer explains, it seems that our visual system can ‘cancel out’ the motion by compensating for eye movement in one direction with an equal displacement in the opposite direction. Secondly, our vision does not appear blurred during quick eye motion because perception is somewhat weakened or diminished in between saccades, a phenomenon termed saccadic suppression. While no one can fully explain suppression, scientists speculate that clear images obtained prior to or after saccades may rule over or force themselves upon weaker ones experienced during saccades (523-24). While some of the details may still need ironing out, we have a pretty solid grasp on the mechanisms that ‘mask’ eye motion in the case of saccades. This, and our own experience of smooth vision, suggests that Brakhage’s representation of eye motion is inaccurate, at least with respect to phenomenology.

Moreover, Brakhage’s attempt to counteract a general ignorance (or in the case of commercial cinema, a purposeful omission) of such movements through a critique of the pan indicates his own ignorance of the particular movement that occurs during the human equivalent of this technique, very different in kind to saccadic movement. When we follow an object with our eyes, as the pan suggests we do, we make use of smooth pursuit movements, which ensure that an object remains stationary on our retina as we track its
motion through the world. Pursuit movements differ from saccades in that they are not
jerky and sudden, but quite smooth and continuous, and also much slower; additionally,
in pursuit movement the tracked object will remain sharp while its surrounding scene will
appear to blur, because of their motion across the retina.

So let us analyze wherein lies Brakhage’s confusion. Insofar as we track a
particular object in motion when we are stationary, pursuit movement functions much
like the cinematic pan, so long as the pan represents the view of someone tracking an
object. In other words, we can move our eyes quite steadily and smoothly across a room
when we’re standing still and following an object. Moving our eyes steadily across the
room is only “the impossible,” as Brakhage states, when we look about generally rather
than following a particular object in motion (as an example, try scanning the room
aimlessly and then following the steady motion of your finger across the same path; a
steady, smooth vision is indeed possible in the latter case!). Certain discrepancies surely
occur in the cinematic pan, such as the lack of blurred motion in the scene surrounding
the followed object; but overall, a smooth pursuit proves possible. So while Brakhage’s
films remain somewhat faithful to the physiology of our system, they bear no
resemblance to our experience of vision. Indeed, it seems that his quest for a heightened
realism paradoxically results in images just as contrived and misconceived as those of
Hollywood. Brakhage’s belief that “only the ultimate of knowledge can balance the
wobbling pivot” (12) that film has become in the hands of Hollywood results in a tragic
reversal of his own project. Knowledge and reason, familiarity with facts, and intellectual
preconceptions—the very targets of his critique of cinematic vision—ultimately come to
dominate his own cinema.
It might prove useful, however, to observe Brakhage’s somewhat inaccurate attack against Hollywood’s ‘homogenized’ vision in light of recent scientific literature. Even if he misinterprets much of the data, his impulse might shed light on other equally accepted and equally misconceived popular theories of vision—and rid science of concepts detrimental to its truth-seeking teleology. Perceptual psychologist and cognitive neuroscientist Susan Blackmore argues, for instance, that many common beliefs based on weak metaphors and early misconceptions about perception in film demand urgent revision. Concepts such as stream of consciousness, and more specifically stream of vision, exhibit a fundamental misunderstanding of visual processes. The notion of a stream of vision, a fluid continuum of vivid pictures available to the eye, has proven utterly false (as the aforementioned saccades exemplify), and yet continues to dominate common knowledge of perception. With the advent of the cinema, she argues, this trope gains force, under the suggestion that vision is essentially like a “movie-in-the-brain.” As an antidote to this misconception, she proposes that people reflect arduously and persistently upon their own experiences to recognize that in fact vision looks nothing like a stream:

I suggest that we all need to look- and look very hard, with persistence and practice. Experimental scientists tend to eschew personal practice of this kind [but] this kind of practice can give rise to completely new hypotheses about consciousness. And this in turn can lead to testable predictions and new experiments.

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19 Change blindness, the inability to detect large changes in an image between saccades, blinks, and during flicker, provides more evidence against stream of vision. In this phenomenon, an individual is presented with an image, and during a brief interruption a sizeable element of that picture (occupying as much as a fifth of that area) changes dramatically without that individual noticing any change. This essentially shows that no ‘stream of vision’ exists, but rather our vision is much sparser and choppier than we had imagined.
The method for this revelatory vision or ‘view from within’ is, precisely, to look “hard and persistently at our own visual experiences” (Blackmore). Only through this personal research can we ever attain intellectual and personal understanding of vision. In this light, Brakhage’s early cinematic investigations seem almost prophetic. Surely his theory would benefit from a hefty revision—but if he succeeds at making audiences look hard and persistently at their own vision, there may be more value in his work than perceptual ‘accuracy’ on its own can ever certify.

To assess the full weight of his contribution, we will now consider the phenomenological counterpart to Brakhage’s physiological reparations.

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As an antidote to the rational seeing exemplified by both our everyday interaction with the world as well as the perception ‘replicated’ in commercial cinema, Brakhage suggests that we adopt a whole new attitude to vision, whereby knowledge of the object takes a backseat to the phenomenological experience of seeing that object. In other words, Brakhage hopes that in watching his films, the viewers will obviate any search for meaning or rational understanding of the scene to focus on how that scene presents itself to our eyes, i.e., what particular stimuli we are sensing. If we take perception to be the “process of acquiring knowledge about environmental objects and events by extracting information from the light they emit or reflect” (Palmer 5) then Brakhage essentially shuns perception per se and instead turns to sensations. For him, the value of vision lies not in the knowledge gained through objects and the light they ‘emit or reflect’ but in the very process leading to this knowledge, that is, the light itself. Scientific frameworks
define perception as resolutely and fundamentally a “cognitive activity” which depends on “information processing” for “veridical perception” (Palmer 5).

Brakhage’s project seeks to present exactly the opposite paradigm: a kind of seeing that seeks no knowledge about the world, but rather about the individual and his relation to it; that requires no processing, because it taps raw data, or sensations; and that purposefully eludes veridical perception, broadly considered as the information necessary for successful navigation of the world. Interestingly, scientific literature locates the distinction between camera and eye in the latter’s exclusive ability to perceive, i.e., know something about the encountered scene; whilst Brakhage argues that perceptual (i.e., knowledge-bearing) phenomena abound in the cinematic image, but what are lacking precisely are the individual sensations. For Brakhage, the camera-eye considered in this manner—as an information-gathering instrument—proves useless to artistic practices, and obsolete as a scientific paradigm (since it has been surpassed by other, improved technologies): “as is, the ‘absolute realism’ of the motion picture image is a contemporary mechanical myth” (The Camera Eye 23). For the camera to reveal things anew, it is necessary then to move our attention away from the object of sight and embrace sight as object.

In lieu of ordinary perception, then, Brakhage composes his images as representations of individual sensations. In what is one of his most figurative films, Cat’s Cradle (1959), the viewer can likely discern the objects on screen: a woman, a cat, a rug, a window. But even if somewhat recognizable, these are not the subject of the film, but mere vehicles for a study in color and light and texture. In the image we see only patches of colors, organic shapes, and streaks of light in motion. An extreme close-up on the cat’s fur reveals a complex pattern of delicate stripes, shimmering dots of light, and varying
warm hues, which fill the screen like a tapestry. With a jerk, the screen becomes suddenly infused with a strong magenta light which dances rapidly across a different texture, the glimmering sheet that is human skin. The use of extreme close-ups, soft focus, negative filters, and superimpositions allow Brakhage to transform a scene from the physical world into the sensations they generate in our visual system. With such a strategy, Brakhage hopes to familiarize the viewer with what he *sees* in objects rather than what he *knows* of them.

This attention to the form in which things actually appear to us, in contrast with our system’s interpretation of the stimuli, is the subject of much discussion in scientific literature and artistic practices. Gibson has termed this ability to see in line with retinal projections the ‘pictorial attitude,’ and identified the strategy as the basis for successful pictorial representation. Artists working on two dimensions must be able to focus on how the stimulus looks to our eye rather than how it becomes coded for representation within our visual system, since the retinal image, being flat, better approximates the conditions of two-dimensional seeing found on a sheet or canvas. For instance, in order to convey the way a table looks to us in the real world by way of a 2-d sketch, an artist must ignore the visual system’s knowledge that the table is rectangular, and observe it very carefully to realize that it indeed projects as a trapezoid onto our retina. In Gibson’s theory, the regular appearance of the table as rectangular forms part of the ‘visual world’, a realm in which ‘objective’ perception of ordinary scenes renders the world stable, sharp, and familiar. In contrast, the manifestation of the table as a trapezoid belongs to the ‘visual field,’ the abstracted arrangement of contours and patches. In this kind of ‘subjective’ seeing we forgo knowledge of objects to observe their less familiar appearance (*The Senses Considered* 237). As evidenced by the paucity of such a skill in the general
population, this kind of seeing requires practice and dexterity, and bears no resemblance to our functional vision (otherwise, as Gibson claims, we would all be artists).

The effect that Brakhage’s activity produces on the viewer thus finds support in both artistic and scientific accounts of reflexive vision. Through a concerted effort to see differently, one can observe stimuli as they appear to our eye. Indeed, the discrepancy between Brakhage’s sensual seeing and cognitive or rational perception collapses on this point, since in both cases a special kind of attitude is required of the viewer in order to experience the patchwork of colors and textures that Gibson and Brakhage respectively describe and depict. Can Brakhage then be said to provide a visual correlate to Gibson’s theory of the visual field?

The answer to this question is both yes and no. Brakhage’s work functions as the visual counterpart to the theorized visual field insofar as it instantiates an act of heightened awareness or consciousness similar to that described by Gibson. Both prototypes draw a line between ‘unattended’ seeing, which we take for granted but constantly draw on to interact with the world, and ‘attended-to’ seeing, an intentional activity with only itself as object. In both cases, this latter activity revolves around the act of discovering how things appear to us, or in Vivian Sobchack’s words, it “looks not to what appears as visible, but to the visible’s mode of appearing” (92). To the extent that both theories consider these as discrete rubrics, demanding different attitudes from the viewer and resulting in novel ways of seeing, we can draw a neat parallel between Brakhage’s cinema and Gibson’s perceptual theory. However, to extend the parallelism between these two accounts further would be to overlook a pivotal distinction between them—namely, the different processes they deem responsible for pictorial vision. That they ascribe pictorial to different processes in turn point to a grander schism between
their theories of perception. As we will see, this deviation from Gibson’s theory—and more generally from modern theories of perception—accounts for a glaring weakness in Brakhage’s project.

Brakhage’s idealized vision locates the raw sensations of color, light and motion at a very early or elemental stage of perception, what we may term low-level vision. These sensations, the elements of the retinal image, are the raw data available to the eye through the base activity of the pathway that extends from retinal ganglion cells to the slightly more complex cells found in the earliest cortical visual processing area (V1). At this early stage, information from the world is coded purely as sensory data, without any adumbration of meaning or function. Brakhage’s ideal sight exists in a realm prior to the brain’s knowledge-seeking intervention, and thus assumes a primordial status of unadulterated sensation. But is such a realm possible within the visual system? Modern scientific literature seems to indicate not. Indeed, accounts such as Gibson’s, which attribute this special, attentive vision to higher cognitive functions, are fundamentally at odds with Brakhage’s early vision theory.

Contrary to Brakhage’s low-level model, Gibson’s ‘pictorial attitude’ seems to be possible only after our system has processed all the data, and through conscious effort. It is a top-down process, which requires higher attentional levels. For Gibson sensations are derived from our experience; seeing them requires an additional step or process, that of consciously attending to the unfamiliar. For Brakhage, on the other hand, seeing our sensations depends on halting or precluding certain perceptual processes, that is, reducing the number of steps in vision (indeed, he calls this process ‘undeveloping’, a term interesting both for its suggestion of reversal or undoing, and its invocation of the camera-eye analogy). His wish to ‘bypass’ perceptual processes betrays an antiquated
theory of vision, which suggests that sensations are primal data, the basic building blocks for our later percepts. As modern theories suggest, the data for perception is quite independent from information on the retinal image, and thus perception cannot be reduced to sensations. While it is possible to conceive of a liminal state in which different colors, shapes, and other features of objects float around before they are analyzed and grouped into a coherent whole, it seems unlikely that we could ever attain consciousness of this stage. For us to have access to these putative sensations, if they were indeed available as images to the visual system, would require in turn that we have an inner eye to see these colors and shapes prior to processing. Because of the endless recession that this ‘homunculus’ notion suggests, modern perceptual theories have completely eliminated the concept of sensations-as-building-blocks from their accounts. Sensations or raw data are never pictorially or imagistically available to us, but are precisely data, computational information (in the form of varying light intensity) processed by our brain.20 The relay station Brakhage wants to ‘return’ to, where sensations abound stripped of meaning—what he terms the “early stages of impressionism” (16)—seems impossible in this context. Modern theories of perception thus render Brakhage’s search for primordial vision quixotic at best, and largely incompatible with recent scientific findings.

Yet Brakhage’s dream of a vision untainted by reason and cognitive expectations shares a common history with centuries of artistic traditions. As fresh as the gesture seems in film, it’s better understood as a modern stronghold of an age-old desire to

20 Or, in the case of Gibson’s unique perceptual theory, these data are gathered directly by our visual system, without any need for processing—much like a tuning fork, the system can transform information in the ambient optic array into coherent percepts.
recuperate the ‘innocence’ of vision, best exemplified in the infant’s eye. The trope of an
ingnent or ‘untutored’ eye that pervades Brakhage’s aesthetics finds its origins in the
roots of philosophy and art criticism. While a thorough history of the innocent eye across
these disciplines would prove monumental, I’d like to focus on just a few instances of
this trope, in order to delineate its scientific basis and artistic pursuit. The earliest form of
this ideal vision took shape in the debate between nativists and empiricists, perhaps best
represented by Descartes and Berkeley respectively, who held diametrically opposed
views on the nature of knowledge. Against Descartes’ theory that innate neurological
mechanisms determine how we see, so that we never need ‘learn’ for perception but are
simply born with the ability to see the world as it appears to us, Berkeley argued that
successful or functional perception is learned through habit and association. In this
account, humans do not have an innate capacity to perceive a stable world, but rather
become familiar with appearances over time. So according to Berkeley, we do always see
what the retinal image provides, simply “colors with their variations, and different
proportions of light and shade,” whose “perpetual mutability and fleetingness” (Wees,
58) confuse the immature visual system.21 Over the years, we begin to discern shapes
and lines, then size and depth, and finally category membership and semantic meaning.

In temporal proximity to Berkeley’s account of perception, critic John Ruskin
would urge artists to restore the eye to its infancy, its pristine state, by forgoing
knowledge of the way things should look like, and appreciating instead how things
appear to our eye:

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21 The quotations, and this debate, are included and analyzed in depth in William Wees’ Light Moving in Time.
The perception of solid form is entirely a matter of experience. We see nothing but flat colors; and it is only by a series of experiments that we find out that a stain of black or grey indicates the dark side of a solid substance (...) The whole technical power of painting depends on our recovery of what may be called the *innocence of the eye*; that is to say, a sort of childish perception of these flat stains of color, merely as such, without consciousness of what they signify... (Gombrich 296)

This theoretical correspondence between art and scientific theories of perception comes to the fore in the practice of Impressionist painters, who believed that the key to reproducing the world correctly was to cleanse the eyes of any preconception and attend only to the way light and color patches appear to our retina. The strength of these artists, according to influential critic Roger Fry, lay in their ability to perceive appearances, and thus discover the true nature of things (for example, that sunlit grass is not green but yellow). In all of these manifestations of the innocent eye, learning to see in this manner is hard but rewarding. The untutored eye for these artists and critics functions not only as an ideal, but as a viable aesthetic and epistemological device.

But such fervent acclaim for the untutored eye in these early accounts cannot survive modern theories of perception. Taking into consideration our knowledge of the brain’s interpretive function in vision, the device seems incompatible with human perception. Our visual system is designed to create coherent percepts in order to help us navigate our environment; it hinges on expectations of what the world will look like, and will respond to stored knowledge of what is most likely to appear in this world. We are meant to recognize objects, persons, and scenes, so that we can successfully interact with them; so regardless of how confusing the stimuli, our eyes want to make sense of them.
As Gombrich states, “whenever we receive a visual impression, we react by docketing it, filing it, grouping it in one way or another, even if the impression is only that of an inkblot or fingerprint” (297). No matter how obscured Brakhage’s textures appear in Cat’s Cradle, our system will sample a variety of different options for the stimuli until it finds the most likely match. Because sensory input is ambiguous, our system must always sort and interpret the data.

Indeed, as perceptual scientist Richard L. Gregory explains, perceptions are essentially hypotheses, predictions based on previous knowledge of objects and on which we depend for survival: “we behave to the present by anticipation of what is likely to happen, rather than from immediate stimuli” (10). So it seems that the difficulty the Impressionists spoke of— the challenge of discovering what things look like to an untutored eye because of the visual system’s habitual trial-and-error processing— is indeed the basis for an impasse. If our survival indeed hinges on this habit of interpretation, the campaign for an untutored eye makes impossible demands. Again we come back to the analogy of eye and camera: if our system worked like a camera, simply registering data, we could conceive of sensation-based vision. But our system does not react to discrete stimuli (as Berkeley claimed); rather, it responds to the entire pattern of light available to our retina, the relationships or ‘gradients’ (as Gibson refers to them) created by stimuli. This relational basis of perception, along with its reliance on previous conceptual knowledge, has lead Gombrich to declare that “the innocent eye is a myth;” and as a result, that “nobody has ever seen a visual sensation, not even the Impressionists, however ingeniously they stalked their prey” (298).

This assertion suggests that the very exemplar of innocent perception —infant vision— is questionable. Indeed, current research in perceptual development shows that,
like Descartes had suggested, children's perception is not the sensory chaos that Berkeley postulated. While the perennial nurture versus nature debate continues to unfold in the matter of perception, recent findings suggest that this immature vision lies somewhere in between Descartes' and Berkeley's philosophies of mind, not as apt as adult vision but quite adept at percepts necessary for a child's first explorations of the world. Low-level vision (luminance contrast, edge detection and contour, etc) appears to function normally in children and even in newborns, as does to some extent perception of color, depth, relative distance, and size. Over time, acuity improves and depth perception becomes more sophisticated, allowing the infant to classify and successfully interact with objects. Far from the "blooming, buzzing confusion" (Gazzaniga 619) that early psychologist William James imagined and Brakhage embraced, infant vision may better approximate adult perception. With the apotheosis of innocent vision debunked, what can we do but give up the concept altogether? Despite its foothold in important philosophical and artistic beliefs, Brakhage's pursuit of the 'innocent eye' proves futile in the context of current perceptual theory.

But perhaps there is a way to salvage the essence of Brakhage's seemingly quixotic quest by locating his contribution on a realm other than scientific accuracy, or even of faithfulness to his own project. I want to suggest that we may find value in Brakhage's gesture, regardless of how well it aligns with current knowledge of our visual system. If the trope of infant vision is misleading, the search for a mode of communication that uses vision to convey information about vision offers an important paradigm in and of itself. We may never have access to our 'sensations,' and as Gombrich claims, these raw, discrete phenomena may not even exist; but that we experience vision in a particular way is hardly a matter of contention. However
(un)successful, Brakhage’s strategy addresses the subjective feelings that accompany visual perception, the ineffable ‘what’s-it-like-ness’ of seeing—the qualia of our perceptions.

The concept of qualia in philosophical debates addresses a question central to all pursuits of vision, artistic and scientific: how do physical processes in the brain give rise to our subjective experiences? Referred to as the ‘explanatory gap’, this question captures what is so essential to the human visual system vis-à-vis the camera. Humans have particular ways of experiencing stimuli in the world, a capacity not shared by the camera, which records data mechanically. Thus qualia account for the aspects of perception that no physical information can describe; what it feels like when we observe, for instance, a cat moving quickly across a room under strong sunlight, and through rapid eye movements. The problem that qualia pose to a scientific discussion is that, as elusive aspects of our perceptions, they cannot be ascertained by any physical methods. But their conceptual existence in philosophy, as well as our own visual experiences, attest to a particular way of feeling things. What Brakhage’s films do in adopting the trope of ‘innocent vision’ is to capture these qualia, or raw feels, and transpose them onto the screen. Since both perceptual theories and personal accounts seem to fall short of capturing the essence of qualia (which by definition are ineffable), Brakhage’s quest no longer appears quixotic, but rather ingenious and forward-looking.

Taking into account the misconceptions that pervade Brakhage’s project, as well as the important precedent he establishes for innovative studies in vision, what lessons can we extract from his films? How do these lessons revalidate his own work, and simultaneously redefine the function of the camera in relation to human perception?
V. Conclusion: Assessment of Brakhage and the Camera-Eye

If cinema is to take its place beside the others as a full-fledged art form, it must cease merely to record realities that of nothing of their actual existence to the film instrument. Instead, it must create a total experience so much out of the very nature of the instrument as to be inseparable from its means. It must determine the disciplines inherent in the medium, discover its own structural modes, explore the new realms and dimensions accessible to it and so enrich our culture artistically as science has done in its own province.

Maya Deren, “Cinematography: The Creative Use of Reality” (227)

The goal of this discussion has been to assess the value of Brakhage’s work as both scientific investigation and artistic practice of a shared subject of interest: the human visual experience. We have seen that multiple factors compromise his perceptual accuracy, and the theoretical soundness of his project. A weak grasp of the mechanisms of vision, compounded with his reliance on language to make his visual work intelligible, constitute substantial impediments to his project. Yet, as certain scientific and philosophical accounts of vision suggest, Brakhage’s exegesis on vision also offers important parameters for further research—most notably the recognition of subjective ways of experiencing the world and the effort to ascertain these through a strong commitment to visual self-reflection. What remains to be determined is the extent to which Brakhage’s films recast the purpose and power of the camera, in strict opposition to the commercial paradigms he abhors. How does the widely contested analogy of eye and camera, in other words, emerge from Brakhage’s experiments—and what are some of the long-term implications of this outcome for the medium?

By way of conclusion, and in order to answer this question, I would like to return to the antithetical positions exemplified by Bazin and Brakhage in the opening quotations, and thus come full circle in the discussion. Both Bazin and Brakhage believe
in the camera’s capacity for inviolate truth—the exclusive ability of the medium to reveal conditions of reality. The difference in their theories of film stems from a diametrical conception of what it means to be ‘truthful’. Indeed, any appraisal of realism requires that we ask: truthful to what, or to whom? In the case of Bazin, truth to reality hinges on how objectively we represent the world, without the interference of idiosyncratic visual and emotional qualities. A truthful image for him is that which resembles most closely Gibson’s concept of the visual world. The recipe for truth hence lies in an aesthetic germane to the preservation of such a functional reality—that is, in using the camera in strict accordance with its in-built mechanisms. For Bazin, the camera should work within its limitations, and refrain from exceeding human vision, where exceeding refers to any phenomena unavailable to the naked eye (interestingly, he does not consider the ‘purification’ or objectivization his preferred cinematic image undergoes to ‘exceed’ but rather clarify or cleanse muddled vision; this stands in stark contrast to techniques which extend or distort visibility in the way that magnification or dialectic montage would). In other words, the camera should attempt to imitate human perception in its optimal state, eliminating any kind of accident or obstruction to vision.

Brakhage’s theory completely overturns Bazin’s paradigm. Being truthful to reality means representing the world subjectively, with the full range of sensations that a percept may carry—the way the world, in fact, rarely looks like to us. The camera should capture the Gibsonian visual field. Consequently, the path to truth lies in subverting the in-built limitations of the camera, or as P. Adams Sitney claims in his seminal Visionary Film, in “overcom[ing] imaginatively the built-in predispositions of the equipment as it is standardized and manufactured” (137).
Such contrasting positions find their origins in a legendary debate among early giants of film history, namely the classical division between Georges Méliès and the Lumiere brothers— the first concerned with expanding the range of human vision and imagination, the latter in reinforcing the quotidian, mundane vision that characterizes most of our interactions with the world. Indeed, this question as to what constitutes the cinema’s *raison d’être* and, subsequently, its ‘correct’ application, lies at the core of film history and practice. In the modernist doctrine that perfused Brakhage’s working period, the concept that a medium must be true to its nature (by embracing only what is exclusive to it) became the dominant rule among modernist artists. For painting, one should adhere to the flatness of the canvas, and eschew all illusions of depth. But in the domain of film, Greenberg seemed to have opened a can of worms—the dictum raised more questions than any answer could satisfy. Decades later, the question still remains—what is the ‘nature’ of cinema, its unique, distinguishing quality?

I will argue that if film’s unique capacity proves difficult to define it does so precisely because its nature or essence lies in *hybridity*. The exclusive quality of the cinema is its multifariousness, the way in which it combines similarity and distance from reality, multiple modes of communicating, and a simultaneous address to multiple senses. As a prime figure of the American film avant-garde, Maya Deren’s thoughts on the ‘correct’ use of the medium may prove paramount to the discussion—especially as she shared an important relationship with Brakhage, as a contemporary, colleague, and friend, while fundamentally representing Bazin’s take on cinematic objectivity:

The [cinematic] image, with its unique ability to engage us simultaneously on several levels—by the objective authority of reality, by the knowledges and values which we attach to that reality, by the direct address of its aspect, and by a
manipulated relationship between these—is the building block for the creative use of the medium (223).

Deren's outlook indeed reflects Bazin's respect toward the camera mechanism and its sacrosanct design. She considers its direct reference to the world the biggest asset to the medium. While her films would certainly have displeased Bazin, with their disorienting temporal and spatial strategies, her insistence on the preservation of reality bears the ideological traces of Bazin's preferences. For Deren, certain cinematic manipulations can augment the power of the image, even if they play upon reality. She praises techniques that belong to the cinema uniquely and which can, if used correctly and creatively, further entrench the medium in its growing artistic status. The zoom, slow motion, reverse motion, and the photographic negative image—all of these are accepted ways of playing with the image, because they 'reveal' and 'express', though still within the parameters of recognizable reality, hence still enforcing the fidelity and authority of the image.

However, she claims, the function of the camera comes in danger when the artist, enamored by the camera's endless possibilities, uses the medium as a vessel for something other than physical, immediate reality—when the physical content of the world becomes auxiliary to the sensational content of the image:

While the [photographic] process permits some intrusion by the artist as a modifier of that image, the limits of its tolerance can be defined as that point at which the original reality becomes unrecognizable or is irrelevant (as when a red reflection in a pond is used for its shape and color only and without contextual concern for the water or the pond). [italics mine]

In such cases the camera itself has been conceived of as the artist, with distorting lenses, multiple superpositions, etc. used to simulate the creative action of the eye,
the memory, etc. Such well-intentioned efforts to use the medium creatively, by forcibly inserting the creative act in the position it traditionally occupies in the visual arts, accomplish, instead, the destruction of the photographic image as reality (223).

There can be no doubt that this criticism is directed towards Brakhage and his increasing deviation from the basic tenets of cinematography—particularly, with films in which the image consists of hand-painted film in lieu of a recorded image, and, as an extreme example, his 1963 landmark film Mothlight, which forgoes the material film completely and instead fashions a strip out of moth wings and tape. Such acts radically reconceptualize the metaphor of camera-eye, and its possibility for perceptual replication. For Deren, this complete severance from photography's referential quality—now not only in terms of the image, but of the material and apparatus of the medium itself as well—constitutes an utter disregard for the camera's propensity, its appetite for reality. Interestingly, Deren also suggests that cinematic vision should not attempt to replicate perception physiologically or phenomenologically—indeed, viewpoint should only be indicated psychologically, through a subjective manipulation of time and space.22

Like Deren, I claim that a sense of reality makes for an effective presentation of the world—and is indeed crucial to the creative possibilities of the medium. As I argued before, and as Arnheim implied, the camera gains its power both from its connection to and slight deviation from our physical experiences. A baseline sense of reality might be

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22 By the term 'psychologically' I am referring to a kind of seeing more subjective or visceral than phenomenology of vision, when the phenomenology reveals only functional or 'normal' vision. For Deren, the value of experimentation with the medium lies in, for example, slowing down time through the camera or using the zoom to play with space in accordance with how a particular moment or scene felt to the subject, because of a particular mental state (anxiety, fear, excitement). She is not concerned with the phenomenological counterpart to physiological activities per se (as Brakhage might be) but instead with the emotional possibilities allowed by the camera's transformative tools.
necessary as a departure point for any imaginative practice. But I also wonder whether Deren’s fixation with reality as the ultimate criterion for filmic value might place the camera in a position of inferiority vis-à-vis the eye. The hesitation to exploit cinematic possibilities for fear that they may appear untrue or gimmicky to the visual system depreciates the camera’s power and potential to do something else entirely. Indeed, I propose to conceive of the camera as a phenomenon related to, but distinct from, vision—so that it is not superior or inferior, better or worse, more or less real, than the eye; but rather, an instrument that yields an experience unto itself.

The danger of condemning the cinema to mere mimesis manifests itself clearly in the following statement by critic Jean-Louis Commolli: “The cinematic image grasps only a small part of the visible; and it is a grasp which—provisional, contracted, fragmentary—bears in it its impossibility” (Sobchack 308). In response to Commolli, I rephrase this dictum to suggest that the cinematic image grasps something akin but not equal to vision; and it is a grasp which—indeterminate, flexible, malleable—bears in it is full possibility. I am arguing that the camera provides an image that the naked eye can never capture; and that we may value the medium not for how well it approximates, but indeed how well it deviates from, our normal vision.

In this respect, I believe that Brakhage’s project restores power to the cinema, by displaying its ability to show something unavailable to the naked eye: its own vision. In showing us the red pond as a blob of color rather than as a red pond, Brakhage singles out the unique ability of the cinema to reveal something common to our experience in a different way, and points to the image’s revelatory potential:

I am finding now that all my seemingly speculative color pursuits have had precedence in my filmic statements, subconscious invitations which unfortunately
needed the conscious approval, my low level taking more cognizance of the
gadget, the science toy, than of my own aesthetic visionary encouragement (My
Eye 31).

Brakhage’s assertion that the camera—by virtue of its particular approach to reality—
can make us aware about our visual experiences more so than our own vision, captures
the ultimate power of the medium. Sitney’s claim that for Brakhage the cinematic image,
“through the limited scope of the technical apparatus” effects “a severe diminution of
human eyesight” (Modernist Montage 203) seems not only misattributed to the
filmmaker, but to the medium at large. Indeed, Brakhage’s project ascribes a powerful
revelatory role to the camera-eye, echoing Vertov’s concept of the Kino-Pravda, or
‘cinema-truth’. In a loose interpretation of Vertov’s concept, I suggest that the cinema-
truth acts as the ultimate arbiter of reality, bringing the ‘truth’ of our own subjective
experience, and the ‘truth’ of the physical world, into close acquaintance.

Early in the discussion, I pointed to the explanatory gap in regards to perception,
and pitted Bazin’s scientific aspirations against Brakhage’s artistic ones in the search for
a fuller understanding of vision. I now conclude that the ‘objective’ and the ‘subjective’
are not mutually exclusive, but in fact quite compatible in the cinematic medium—and
that this conflation of empiricism and intuition offers a formidable model for further
research. The camera’s ability to tell us much about the physical world—what Bazin
praised, and Gibson practiced when he used the camera to train pilots in aviation—is no
more valuable, as far as perceptual studies go, than its ability to convey information about
the *phenomenological world*. Indeed, it would seem that a combination of both is not only desirable, but perhaps necessary for a fuller understanding of perception.

It seems to me that Bazin’s prescribed filmmaking allows us to obtain information by confirming what we already know of the world. In replicating functional vision, ‘objective’ filmmaking offers the physical environment as a departure point for further investigations—in the case of Gibson, allowing him to train aviators, and in the case of Bazin, allowing filmmakers to tell a particular story. Brakhage’s films, on the other hand, have the potential to make us *discover new things* about vision. Rather than confirm hypotheses about the physical world, the kind of self-reflexive seeing his films encourage can bring important revelations about the way we experience the world. Both of these paradigms offer important information regarding perception, and yet they have for the most part remained separate—Brakhage denouncing the ‘objective’ approach, and Bazin denouncing his ‘subjective’ attitude. This split also appears within the scientific community, with those who conceive of research as the confirmation of empirical data, and those who, like Blackmore, promote instead the technique of introspection. But if the cinema, like Bazin claims, “is objectivity in time” (198); and can capture, like Vertov asserts, the “*feel* of the world” (356), then why should we limit our use of the camera to one of these two approaches? A complete account of vision through film is possible, I argue, if these two values—the impulse to confirm and the impulse to discover, fidelity to the world and fidelity to the subject—can coalesce.

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23 In his 1947 report *Motion Picture Testing and Research*, Gibson investigated film’s capacity to train pilots of the Army Air Forces in aircraft identification. His report addresses the characteristics of the motion picture medium that make possible psychological testing for aviation, such as movement, pacing, and realism (9-18); and considers the value of these qualities for the purposes of practical training.