CHAPTER 3

Bottom-up Processing, Entoptic Vision and the Innocent Eye in the Films of Stan Brakhage

The purpose of this chapter is to consider how Stan Brakhage as a practical psychologist compels the viewer to attend to their visual perceptions in a unique way when engaging with his films. It will begin by outlining John Ruskin's concept of the innocent eye, and its relevance to Brakhage's creative aspirations. The discussion will then consider the idea of the innocent eye in the context of existing theories on visual perception, and suggest that 'retutored eye' may be a more suitable name. Following this, two ways will be proposed in which Brakhage was able to retutor the eyes: the first is by paying special attention to entoptic vision (visual impressions whose source is within the eye itself) as a source of inspiration; the second is by developing a series of techniques that compel the viewer to attend to the visual information on the screen in a way that subordinates semantic salience, and emphasizes the surface detail.

Stan Brakhage's concept of the 'untutored eye' and the constructive theory of perception marks one of the clearest convergences between the concerns of avant-garde filmmakers and cognitive scientists. Constructivists argue that perception is indirect in the sense that we usually depend on internal processes instead of direct perception.[1] They suggest that the reason the world appears to be stable as we encounter it, even though our sensory information is in constant flux, is because we apply schemata – arrangements of knowledge already possessed by the perceiver – to almost everything we encounter, using them to predict and classify new sensory data. According to constructivist doctrine advanced by Hermann von Helmholtz and later elaborated on by psychologists Jerome Bruner, Ulric Neisser and Richard Gregory (Eysenck and Keane 2000: 54), perception is

an active, goal-orientated sense-making process. Because sensory information is incomplete and ambiguous, it cannot determine a percept alone. The perceiver, then, makes a perceptual judgement based on a series of inferences.

Inference proceeds on a continuum between two poles. It can be developed from the bottom-up, meaning that sensory information provides the details necessary to make the appropriate inference. This occurs when the sense data alone determines perception without transformation in light of stored information; for example, touching a hot stove tells you that it should not be handled. When the inference is made from the top-down, perception is guided by expectations, background knowledge and problem-solving processes (Bordwell 1985: 31). Face recognition would be one example of top-down perception. In both top-down and bottom-up processing, inferences are involuntary and virtually instantaneous, but most percepts involve both top-down and bottom-up processing.

Like our interactions with the natural world, film spectatorship involves both top-down and bottom-up processing. Bottom-up visual perception such as edge, colour, depth, motion and aural pitch detection is employed, without recalling associated memories and creating only immediate impressions. Cinematic storytelling, however, cannot be defined by bottom-up categories as objects contained therein are referential and thus depend on prior knowledge and unconscious inferences. Because avant-garde film invariably problematizes narrative comprehension and sometimes puts a greater emphasis on surface detail, this suggests that bottom-up and top-down processing are employed in a manner distinct from conventional narrative-dramatic filmmaking.

Of all filmmakers from any aesthetic tradition, Stan Brakhage perhaps made the clearest call for the possibility of a cinema that depends solely on bottom-up processing, in which the work is to be engaged by virtue of its surface details, without relying on prior knowledge and expectations. With this creative ambition, Brakhage studied his own perceptions and intuitions rather than using constructivist language or making direct reference to it. Nonetheless, there is a direct convergence between his creative concerns and this theory of perception. The pervasiveness of the following passage written by Brakhage demonstrates how widely it has been used when understanding his aesthetic:

> Imagine an eye unruled 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. How many colors are there in a field of grass to the crawling baby unaware of 'Green'? How many rainbows can light create for the untutored eye? How aware of variations in heat waves can that eye be? Imagine a world alive with incomprehensible objects and shimmering with an endless variety of movement and innumerable gradations of color. Imagine a world before the 'beginning was the word'. (Brakhage 2001a [1963]: 12)

Although this declaration was considered liberating for filmmakers in its time, it was only radical insofar as that the sentiment had not yet been fully articulated in a written statement for filmmakers. Film scholar William Wees traces Brakhage's declaration back to a variety of other writers, who predate the above passage from *Metaphors on Vision*. In J.D. Salinger's 'Teddy' for instance, the title character claims that if children are taught that grass is green 'it makes them start expecting the grass to look [that] way', rather than 'some other way that might be just as good, and maybe much better' (1970 [1953]: 299). J.R.R. Tolkien suggests in a 1947 essay 'On Fairy Stories' that we need to 'clean our windows; so that the things seen clearly may be freed from the drab blur of triteness or familiarity – from possessiveness' (quoted in Pearce 2001: 166). Aldous Huxley used the psychoactive drug mescaline to inhibit his interpreting mind. Describing his experience in *The Doors of Perception* he comments that 'Visual impressions are greatly intensified and the eye recovers some of the perceptual innocence of childhood, when the sensum [is] not immediately and automatically subordinated to the concept' (2009 [1954]: 25).

Looking further back, the term innocent eye originates with the art historian John Ruskin, who comments in *A Joy For Ever* that 'one of the worst diseases to which the human creature is liable is its disease of thinking. If it would only just *look* at a thing instead of thinking what it must be like . . . we should all get on far better' (2007 [1857]: 106). For Ruskin, one of the greatest barriers to true visual sensitivity is that people see what they think they know to be there, rather than what they actually see. In constructivist language, Ruskin would say that our ability to attend to the world from the bottom-up is inhibited by the nonconscious reflex of applying top-down processing (although his theory predates constructivism by about a century). In *The Elements of Drawing,* he comments 'The whole technical power of painting depends on our recovery of what may be called the *innocence of the eye*; that is to say, of a sort of childish perception of these flat stains of colour, merely as such, without consciousness of what they signify – as a blind man would see them if suddenly gifted with sight' (Ruskin 2011 [1865]: 52). Brakhage's famous passage, then, should be understood as part of a longer tradition, and his 'untutored eye' can be understood as continuous with Ruskin's 'innocent eye'.[2]

How might viewers switch off their interpreting mind in the natural world, and attend to their visual surroundings without engaging them for their semantic content? As Ruskin suggests, newborn babies are not yet equipped to interpret their surroundings, and giving sight to the blind through surgery also offers a form of innocent vision. Unlike a baby, the newly sighted child or adult can articulate his or her experience. The earliest report of this came in 1728 by the surgeon William Cheselden, who removed cataracts from a 13-year-old boy who had been blind from birth. Reportedly, once given sight, the boy could not immediately make any judgement with regard to distances, nor could he discern

objects as being separate. Subsequent reports suggest similar cases in which the newly sighted individual perceives coloured patches, indistinctly separated from one another (Wees 1992: 59). What Cheselden came to believe, then, is that the optical field (i.e. vision for the subject not yet in possession of a visually interpreting mind) resembles an arrangement of coloured patches for everyone in early infancy. It is only over the course of time that these sensations take on shape, solidity, distance and identity.

Although newborn babies, or those who have just been given sight, might serve as a utopian model for the experience of 'innocent' vision governed solely by bottom-up processing, current constructivist research suggests that those with ordinary vision are unable to return to such a visually naive state. Top-down processing and the application of schemata to our visual field is always present and we have a spontaneous, uncontrollable reflex towards experiencing our surroundings as solid, three dimensional and nameable. Psychologist Richard Gregory characterizes perceptions as hypotheses, suggesting that perceptual information is always 'cooked' by prior knowledge and expectations. Summarizing this position, he comments 'if past experience, assumptions, and active processing are important, there can hardly be raw data for vision' (Gregory 2004: 9). Cognitive psychologist Donald Hoffman describes the human facility to process and construct one's visual field as a form of 'creative genius' when detailing early developmental stages of visual construction. He explains how quickly we lose our visual 'innocence':

> By about the age of one month, kids blink if something moves towards their eyes on a collision course. By three months they use visual motion and construct boundaries of objects. By four months they use motion and stereovision to construct the 3D shapes of objects. By seven months they also use shading, perspective, interposition (in which one object partially occludes another), and prior familiarity with objects to construct depth and shape. By one year they are visual geniuses, and proceed to learn names for the objects, actions, and relations they construct. (Hoffman 2000: 12)

The period when a newborn child can be said to possess innocent vision, then, is short-lived. In *Art and Illusion* (2002 [1960]), art historian Ernst Gombrich drew from the constructive theory of visual perception in an effort to argue that the artist's eye is never 'innocent' by demonstrating how artists are guided by prior knowledge and expectations when painting scenes. Comparing the artwork of an 11-year-old child next to the work of the English romantic painter John Constable, Gombrich observes that the child misses or underestimates the modifications that various objects undergo when seen from different angles, or in different light. In addition, when painting a pastoral landscape, the objects that would interest a child – like swans and trees – tend to be oversized (ibid.: 247–48).

The child, then, depends heavily on pre-existing top-down conceptual frameworks for each object in the painting. Gombrich also observes that medieval

artists operate in a similar way to modern-day children in the sense that they also have single, generic templates for painting objects of interest. He comments, 'The medieval artist, like the child, relies on the minimum schema needed to "make" a house, a tree, a boat that can function in the narrative' (2002 [1960]: 248)

Constable, by contrast, does not solely draw from a set of generic assumptions about how a tree, a swan or any other object is painted; he also makes allowances for the transformations that colours and shapes undergo depending on lighting and the position of objects. Did he attend to his surroundings with an 'innocent eye' when re-creating them on canvas, addressing solely his bottom-up perceptions? Not necessarily. According to Gombrich, Constable represents a heightened state of accomplishment as an individual artist and, in the collective evolution of fine art in the West, he was an exemplar in his ability to reproduce what appeared in front of him. His ability to observe his surroundings without reverting back to a pre-existing set of schemata for each object might be understood as the application of 'innocent' vision – a visual sensitivity working from the bottom-up, unguided by pre-existing concepts; however, Gombrich suggests the contrary. Constable draws from more schemata and thus more prior knowledge in order to reproduce his visual field, rather than less. This type of vision comes from years of training and learning the variables available to the artist, not from a return to innocence. Gombrich explains:

> 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 a fingerprint . . . It is the business of the living organism to organize, for where there is life there is not only hope, as the proverb says, but also fears, guesses, expectations which sort and model the incoming messages, testing and transforming and testing again. The innocent eye is a myth. (ibid.: 251)

In applying the conventional constructivist position on visual perception, Gombrich claims that Ruskin's innocent eye (and Brakhage's untutored eye, by extension) is implausible. Top-down processing cannot simply be switched off. If the innocent eye is to be considered a myth, however, there may be a simple way of shifting the terms by which we are to define innocent vision to make it a plausible concept again. The problem may lie in calling Constable's mode of vision 'innocent' or 'untutored', which implies naivety and pure bottom-up processing.

Visual psychologist James J. Gibson, a contemporary of Gombrich, accommodated the idea of a mode of seeing that is comparable to the notion of an innocent eye. He distinguishes between the visual world and the visual field, and these might be comparable to 'tutored' and 'untutored' vision. Gibson compares these two different modes of visual attention by asking the reader to imagine a room they might inhabit. In the first mode (the visual world), one sees a familiar and stable scene of floors and walls, and a variety of objects with relative

distances between them. The book at the far end of the room looks like it is the same size as the book next to you. Square objects look square, and horizontal objects look horizontal. This is a commonplace, familiar way of engaging one's visual surroundings that draws explicitly on top-down processing, as the viewer recognizes that the visual impression of the various objects is informed by their spatial distance, and the angle at which they are being viewed. Gibson then asks you to imagine looking at the same room and attending to the visual field as if it consisted of patches of coloured surface, divided by contours:

> The attitude you take is that of the perspective of a draftsman (that is, seeing that, as on a flat picture plane, 'square objects' are really trapezoid, 'horizontal surfaces' are inclined planes, the book across the room is much, much smaller than the one lying in front of you, and so on). . . . You may observe that it has the characteristics somewhat different from the former scene. This is what will be called here the *visual field*. It is less familiar than the visual world and it cannot be observed except with some kind of special effort. (Gibson 1950: 26–27)

What we need is a compromise between Gombrich's acknowledgement that we possess a natural impulse to file and categorize visual stimuli, and Gibson's distinction between the visual world and the visual field – both of which require top-down processing, even though the visual field is loosely comparable to the bottom-up visual array that newborn infants experience. The conflict between the two theories perhaps arises from describing the visual field as innocent or untutored vision, which implies strict bottom-up processing, and is considered an implausible claim today. We might instead call it retutored vision, which requires more schemata and 'eye training' for engaging with the world, and is in this sense radically top-down. Gombrich and Gibson agree that attending to the visual field requires a special effort. Engaging with the visual field, like draftsmen do, or Constable did when he painted his surroundings, is a radically top-down activity, while the newborn baby and the 13-year-old boy who had his cataracts removed engaged with their visual fields radically from the bottom-up. The newborn baby and the painter ultimately reach a similar place, so to speak, but they approach it from different directions.

Sense as Muse

Up to this point, the possibility that a person can attend to their surroundings with an innocent eye has been explored, experiencing the most immediate and unmediated form of visual perception. Existing research on visual perception suggests that returning to this naive state is an impossibility. Although existing top-down perceptual facilities cannot be discarded, it has been suggested that viewing habits may be retutored so that the viewer may attend to the visual field

instead of the visual world. They do so with the use of a specialized effort that depends on top-down inferences, rather than bottom-up data-driven perception.

For Brakhage, the 'untutored eye' represents a primal vision of the world, as if it is being seen for the first time. He was, however, aware of the top-down dimension to visual perception (although he did not use that term). Paul Arthur (2003) suggests that Brakhage's aesthetic is designed to drive towards an ideal, rather than attempting to attain an impossible goal:

> Although he readily admits that any actual return to a state of 'innocent', childlike vision is impossible, the persistent project throughout his vast oeuvre has been to guide the eye in a journey of 'untutoring', using every possible cinematic tool as leverage for that journey.

As such, we as viewers do not experience innocent vision itself when viewing his films. Instead, we see Brakhage's representation of innocent vision that should sensitize us to a richer and more varied visual life. The argument advanced so far has been that while it may feel like we are discarding prior visual habits, in reality we are expansively developing new skills and sensitivities. Engaging with Brakhage's films, it is suggested we retutor our visual skills, instead of untutoring them.

Because cinema has traditionally exploited the ordinary human perceptual habit of focusing on the visual world instead of the visual field, Brakhage sought to develop an expressive style that compels the viewer to pay attention to the visual field in his films, retutoring the spectator's visual sensitivities by drawing attention to the surface details, rather than their semantic content. The next consideration will address how Brakhage retutors the viewer's eyes.

Brakhage wrote his famous passage about the untutored eye at the same time that he was working on *Dog Star Man* (1961–1964; henceforth *DSM*), a film that invoked responses in his audience that alluded to the possibility of a cinema that could sensitize the viewer to the visual field over the visual world. The poet Robert Kelly famously summarized his reaction to *DSM* with the phrase 'mind at the mercy of eye at last'[3] (2005 [1965]: 14). Kelly's image of the mind at the mercy of the eye may not hold in the strictest sense for reasons already detailed, yet it serves as an evocative metaphor for a film that subdues the viewer's tendency to attend primarily to the semantic dimension of the imagery onscreen.

One of the ways in which Brakhage accomplished this effect was by attempting to refamiliarize the viewer with the actual experience of seeing, rather than the idealized conception of vision expressed in traditional filmmaking with the conventional use of tripods, focusing, tracking dollies, steady panning and zooming. In a letter to Jonas Mekas, Brakhage wrote, 'I find myself feeling that it is the total physiological impulse of a man must be given form in the making of a work of, thus, called, art' (1982 [1965]: 32). A year later, Brakhage commented that his goal as a filmmaker was to create a filmic equivalent to the act of seeing, stat-

ing 'film is, thus, premised on physiological sense – *takes* Sense as Muse'[4] (2001d [1966]: 129).

How might the physiological impulse of man be captured in film? How might sense serve as a muse? In addition to filming point-of-view shots and emulating saccadic eye movements by hand-operating the camera, Brakhage also found inspiration by paying attention to entoptic phenomena – visual experiences whose source is within the eye itself. This is one characteristic of human vision that the conscious mind learns to ignore, as it is of no adaptive benefit – visual information is distinguished from visual noise (Blom 2010: 174; Helmholtz 2005 [1925]: 323). Marilyn Brakhage (2010) explains:

> a major shift [developed in a] strand of Brakhage's work, as 'vision' was increasingly presented as 'thought process' – as the . . . feedback of the nervous system in response to the incoming light being 'spanked' in upon it (as he would say) were given equal weight to any exterior sights.

One example of the entoptic effect includes 'floaters' or muscae volitantes, transparent blobs that slowly drift across our visual field.[5] These can be caused by swollen red blood cells suspended above the retina, which become most visible if you lie on your back and look up towards the sky. Treating the film directly with intermittent marks on the film strip, Brakhage appears to add muscae volitantes to the mechanical vision of the camera lens with speckles of light on the film frame (as illustrated in Figure 3.1). Craig Dworkin makes a similar observation:

> the dust, hair, and scratches visible after that printing – like the surface manipulations of paint flicked from a brush onto the surface of the film or scratches etched
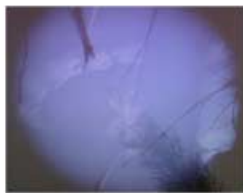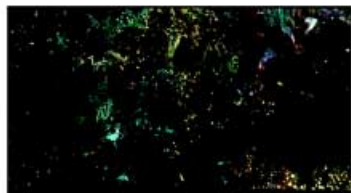

Fig. 3.1 Fig. 3.2 Fig. 3.3

Fig. 3.4 Fig. 3.5 Fig. 3.6

Figures 3.1–3.6. Entoptic effects and 'bad practice' in Stan Brakhage's *Dog Star Man* (1961–1964; 3.1–3.2, 3.5–3.6), *The Dante Quartet* (1987; 3.3) and *Desert* (1976; 3.4). Screen captures by the author.

into the emulsion – all simulate the flinch and drift of entoptic imperfections which cast shadows on the retina as debris floats through the vitreous fluid. (2005: 135)

The purkinje tree is another entoptic effect. This is a reflection of the retinal blood vessels in one's own eye, which becomes most visible if you sit in a darkened room, close one eye and shine a light back and forth in the other eye,[6] such as one is likely to see at the optician's during an eye examination. In *DSM*, trees are a recurring motif, which at times loosely resemble the purkinje tree, as illustrated in Figure 3.2.

Phosphenes are another visual experience not provoked by information provided by the outside world. Patterns of light are perceived in the visual cortex without light entering the eyes; these can be caused by electrical or magnetic stimulation, or simply by rubbing one's closed eyelids, which stimulates cells on the retina, producing 'pressure phosphenes', speckles that can create the impression that you are moving through a star field or a darkened tunnel. They might also be caused by a blow to the head (hence 'seeing stars'), a vigorous sneeze, or standing up too quickly with low blood pressure. Phosphenes also become visible when falling asleep, which is a possible origin of the 'Sandman'. The treated film in Brakhage's *The Dante Quartet* (1987) resembles phosphenes (Figure 3.3).

In addition to phosphenes, the visual system also produces a persistent low level of grainy light, referred to as visual 'noise', even when there is no stimulation of the eye by light (Gregory 2004: 93). Visual noise is most easily discernible when we close our eyes or sit in a darkened room. Once sensitized, visual noise can be registered with our eyes open as well. Generally, as with phosphenes and various entoptic effects, we typically ignore these visual impressions. Gregory comments: 'Imagine some neural pulses in the brain: are they due to light entering the eye, or are they merely spontaneous noise in the system? The brain's problem is to "decide" whether neural activity is representing outside events, or whether it is mere noise, which should be ignored' (2004: 93). Brakhage once said that he is inspired by human vision, and is 'involved with a process so naturally always existent its workings have been overlooked' (1982b [1966]: 40). It might not only be the persistence of visual noise that compels us to disregard it; the brain itself appears to be geared to do so.

In *Vision: Human and Electric*, Albert Rose (1973: 46) claimed that being in a 'tense or apprehensive emotional state' can elicit an increase in the visibility of visual noise. Approximating the agitated and excited vision he experienced watching his proud wife following the birth of their first son, Brakhage filmed his wife during childbirth, and treated the celluloid directly. He gives her face a white halo and blood-like dashes of red using paint in *Thigh Line Lyre Triangular* (1961).

In *Desert* (1976) (Figure 3.4) Brakhage emulates the impression of shimmering beams of light that appear when one squints, as well as the visual distortions

that occur when you are in an intensely hot environment. Flash blindness is another visual phenomenon that can serve as an inspiration. This is where the retinal pigment is bleached and oversaturated by a bright light (e.g. a flash photograph), which causes temporary visual impairment. As the pigment returns to normal, so too does sight. Brakhage's underexposed images, as featured in *DSM* , for example, resemble this effect. All these visual experiences and others take the 'sense as muse' for Brakhage, reawakening the viewer to the subjective dimensions of human vision that we typically ignore.

Dworkin suggests that Brakhage's films reawaken the viewer to the physical nature, the corporeality of human vision rather than conceiving it as an objective, unmediated window to the outside world:

> Brakhage's films, in short, momentarily replace the illusion of the eye's transparent clarity with a clear view of its obstructions. His films, like the bodily experiences they imitate, frustrate the idealization of vision by documenting the obstructions and impediments that the eyes themselves present, and they remind us of the corporeal ground for resisting those ideologies that have attended myths of unmediated transparency. (2005: 136)

When Brakhage aspired to 'sound the depths of all visual influence' (Brakhage 2001a [1963]: 13), he sought to represent all visual information that reaches the visual cortex, and not just light that enters the eye. Training as a draftsman would be one method for retutoring the eyes, observing the visual field in a similar manner to the way Constable observed his surroundings. Attending to entoptic phenomena and other subjective dimensions of vision provide another route, which extends and builds on Ruskin's original conception of the innocent eye.

Here, this discussion draws from Wees's account of Brakhage in *Light Moving in Time* (1992). Wees argued that Brakhage is best understood as an artist who attempted to capture undiluted vision, freed from mental embellishments. Though this chapter is influenced by Wees's discussion, it places the topic in a constructivist context, proposing the less problematic term retutored eye, elaborating on claims set forth by Gombrich and various perceptual psychologists, and also elaborating on entoptic vision, illustrating Brakhage's use of it in his films.

'Bad Practice' and Flattening the Screen

Brakhage developed a series of methods in *DSM* and other films to inform human vision with novel experiences, which might be taken as 'bad' practice with the camera. For example, he resists traditional aesthetic values of 'good' composition, compelling viewers to engage his images with 'an eye unprejudiced by compositional logic' rather than traditionally appealing standards of visual composition. There are images in *DSM* that could be considered poorly framed (Figure 3.5).

Other techniques include letting the 'wrong' amount of light into the lens, according to commercial standards, through overexposure or underexposure. Objects might be stretched out of shape with attachable lenses (Figure 3.6), or out of focus. All of those effects occur in *DSM*.

In adopting putatively 'bad' practice with the camera, Brakhage compels the viewer to appraise his visual style according to a unique set of aesthetic criteria. Nicky Hamlyn offers a rationale for this, and ties Brakhage's approach to the broader practice of avant-garde filmmaking:

> in discussing these films one inevitably resorts to expressions like 'out of focus', yet such expressions are already problematic. First, and most obviously (and not just in relation to Brakhage's oeuvre), the phrase is value laden in ways that will be familiar to anyone who is familiar with experimental film. It assumes a normative and narrowly drawn understanding of vision as focused and stable. In questioning the instrumentalism of dominant cinema's use of film technology, experimental filmmaking must involve a rejection of ostensibly technical terms that turn on unexamined or assumed correlations between focus, clarity, objectivity, and good practice/craft. Such questioning is not unique to Brakhage's oeuvre, of course, but his work constitutes, with a few exceptions, a consistently sustained attack on the dichotomy of focus versus unfocused. (2005: 115)

Coming into focus can be understood as the process of textures sharpening, with lines or edges forming, rather than reaching a discernible, idealized form. Focused and unfocused was one dichotomy Brakhage rejected, along with over- and underexposed. In order to produce the work he did, Brakhage also refused the dichotomy between representation and abstraction, commenting: '"abstract", "non-objective", "non-representational", etc. I cannot tolerate any of those terms and, in fact, had to struggle against all such historical concepts to proceed with my work' (1993: 11). Denying such a distinction, Brakhage sensitizes the viewer to the visual field by gliding and shimmering across images that contain discernible and indiscernible objects in the same manner and fluidly cutting between them, without treating the referent images as if they need to be contemplated any differently to the non-referential imagery.

One of Brakhage's other central strategies when drawing the viewer's attention to the visual field rather than the visual world is 'flattening' the cinematic image, following the lead of modernist painters that had preceded him. Clement Greenberg explains:

> Realistic, naturalistic art had dissembled the medium, using art to conceal art; Modernism used art to call attention to art. The limitations that constitute the medium of painting – the flat surface, the shape of the support, the properties of the pigment – were treated by the old masters as negative factors that could be acknowledged only implicitly or indirectly. Under Modernism these same limitations came to be regarded as positive factors, and were acknowledged openly. . . It was

the stressing of the ineluctable flatness of the surface that remained, however, more fundamental than anything else to the processes by which pictorial art criticized and defined itself under Modernism. For flatness alone was unique and exclusive to pictorial art. (1995 [1960]: 86–87)

Applying a modernist sensibility to cinema, Brakhage comments that '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' (2001b [1963]: 15). In essence, Brakhage suggests that the film camera is tailored to emulate principles of visual perspective that were developed during the Renaissance, which create the illusion of visual depth on a flat canvas (see Livingstone and Hubel 2008: Chapter 7). To undermine the illusion of depth, Brakhage developed a series of specialized techniques; for instance, 'flat' paint was placed over 'deep' photographed imagery. He also tried 'spitting on the lens [and] wrecking its focal attention' (Brakhage 2001b [1963]: 18), and using extreme close-ups so that that the viewer cannot discern what they are looking at, or how shapes and objects relate to one another spatially.

In emphasizing the flatness of the cinematic screen, Brakhage sought to dispel the impression that the cinematic image is a 'window' into a three-dimensional environment. Near the inception of cinema, in the Lumière Brothers' *Arrival of a Train at Ciotat* (1896), the illusion of visual depth is vividly exploited as a train approaches from the distance and moves past the camera (Figure 3.7). For Brakhage, the screen can be understood more productively as a flat canvas on which novel and exploratory visual experiences may take place, rather than a window through which you see into a three-dimensional space. The window

Figure 3.7.   Arrival of a Train at Ciotat (1896) exemplifies the illusion of visual depth. Screen capture by author.

analogy in reference to the cinematic screen remains inadequate for Brakhage in the sense that we cannot look through the screen in the way we can look through a window. Instead, the cinema screen becomes a canvas on which the true nature of human vision may be reawakened. In 'A Moving Picture Giving and Taking Book', Brakhage comments that the filmmaker must see '*with, not through,* the eye . . . *with,* rather than thru, machine' (Brakhage 2001c [1965]: 112). As Wees explains:

> The 'machine' is no more a 'window' than the eye is. Both eye and 'machine' *make* what is seen; hence, cinematic equivalents of seeing cannot be divorced from the materials and processes of filmmaking, any more than human sight can be separated from the body's visual system. (1992: 84–85)

Again, Brakhage highlights the corporeality of the 'physical eye' rather than the idealized form of vision advanced by traditional conceptions of cinematic vision. In highlighting the constructedness of cinema by flattening the screen, he alerts us to the parallel constructedness and materiality of human vision.

Conclusion

Two principal lines of discussion have been explored in this chapter. First, the concept of the untutored eye was placed in a historical context and reassessed in the context of cognitive theories of visual perception, suggesting that it might instead be called the 'retutored eye', which carries less problematic implications. Following this, there was a consideration of how Brakhage went about retutoring the eyes, suggesting that taking sense as muse, Brakhage reintroduced the corporeality of visual perception by approximating entoptic vision and phosphenes; he also exercised 'bad' film practice, compelling viewers to re-evaluate traditional aesthetic standards; in addition, he alerted the viewer to the true nature of the cinematic image by attempting to collapse illusions of visual depth.

There are other dimensions to Brakhage's aesthetic that invite an appraisal from the cognitive perspective. In the later part of his career, Brakhage argued that one of the most significant expressive potentials of film was its ability to re-create that which he came to call 'moving visual thinking' – a non-verbal, non-symbolic dimension of thought that verges over 'into the un-nameable or the ineffable' (Brakhage 2010). Marylin Brakhage goes on to explain:

> Perceiving the mind's movements as being in constant interplay with both visually and sonically received and experienced rhythms, he theorized further that the aesthetic creation of either visually ordered or sonically ordered rhythms could present meaningful equivalents of those inner movements, and he created works in constantly renewing visual forms that would not only respond to a variety of

sights seen – while simultaneously manifesting an interior life and documenting complex layers of optic feedback, or 'closed-eye vision' – but that would give to the eyes (and mind) something analogous to what music gives to us through hearing: 'visual music'.

In *Rage Net* (1988), Brakhage created an equivalent to his inner movements while being in a state of anger by painting directly on the celluloid. In *Lovesong* (2001) he created an equivalence to his inner movements that occur during lovemaking. He went as far as to state 'if science comes up with a machine so you could tap into people's actual thinking process and then project whatever they're thinking as vision and put it up on a screen, I'm doing that laboriously by painting, because we don't have any way to do that'.[7] This may seem like a promising line of discussion for a filmmaker who mines his own cognitive facilities when producing art. Neural oscillations may be the closest phenomena in cognitive science that parallels the idea of ineffable movements in the mind that interact with the 'rhythms' of the exterior world that can then be approximated through film. As such, the mind does respond rhythmically to the outside world. Evidently, this is a complex topic, which has to be considered in more detail in another discussion that does not focus directly on visual experiences. Note, however, that aside from bearing a loose parallel with research from cognitive science, the concept of moving visual thinking relates directly to Romanticism and the 'intellectual' or 'imaginative eye'. According to M.H. Abrams:

> The preoccupation is with a radical opposition in ways of seeing the world, and the need to turn from one way to the other, which is very difficult, but works wonders. 'Single vision', the reliance on the 'bodily', 'physical', 'vegetable', 'corporeal', or 'outward eye', which results in a slavery of the mind to merely material objects, a spiritual sleep of death, and a sensual death-in-life to this way of seeing [Romantic] poets opposed the liberated, creative, and resurrective mode of sight 'throe and not with the eye', the 'intellectual eye', the 'imaginative eye', or simply, 'the imagination'. The shift is from physical optics to what Carlyle in the title of one of his essays called 'Spiritual Optics', and what Blake and others often call 'Vision'. (Abrams 1972: 377, quoted in Turvey 2008: 105)

According to Malcolm Turvey, Brakhage articulates a powerful version of the 'human subjectivity theory', in which various forces in modernity such as science, technology and 'instrumental reason' altered the way that the average person's mind works, enslaving modern consciousness to rational, instrumental imperatives that are 'intrinsically divorced from the senses, the body, and nature in general' (Turvey 2008: 104). Because we cannot *see* in the fullest sense of the word, the artist can compensate for our flaws in normal vision by, for instance, looking inward to attain visual knowledge that is free from rationalistic consciousness, via moving visual thinking. Alternatively, as in the case of Brakhage,

they might evoke a cinema that re-creates vision with saccadic movements, phosphenes and entoptic vision.

According to existing cognitive research, it is not modernism that alienates us from attending to the full richness of visual experience; it is the nature of the brain itself to mentally organize objects encountered and ignore non-utilitarian visual experience such as phosphenes and entoptic vision (Gregory 2004: 93). Brakhage is an exemplar of the model of the practical psychologist who explores his own cognitive capacities and draws inspiration from them while expansively engaging the viewer in a novel way. It is not the goal of this article, however, to justify all of Brakhage's intuitions about the mind or visual perception by finding a direct correlation in the field of cognitive science. Brakhage was inspired by the idea of providing an antidote to modernist consciousness, of returning to a prelinguistic visual utopia, of refusing the distinction between figurative and abstract imagery, and attempting to express an ineffable visual correlation to the movements of the mind. These concepts enabled him to produce a prolific and evocative body of work. Their value as theories can be measured in large part by the art they inspired, rather than whether they run directly parallel with existing scientific research. The interactions between human perception and thought – with its corporeality, limitations and idiosyncrasies – productively served Brakhage as a creative muse.

The previous chapter suggested that avant-garde filmmakers sometimes direct the viewer's attention to the surface details of a film over its semantic content. While Brakhage was widely connected to this idea, and was perhaps cinema's most outspoken polemicist of the 'untutored eye', he was not the only artist who used referential imagery while directing the viewer's attention to surface detail. This discussion, then, might be expanded upon by considering how other filmmakers pursued similar creative goals – Ken Jacobs and Malcolm Le Grice, for example, did so by manipulating film footage with an optical printer. Bruce Baillie, Peter Tscherkassky and Ron Rice used different techniques to similar effect. In the following chapter, we will consider Robert Breer's creative approach to directing the spectator's attention to surface details and challenging human visual perception.

Notes

1. The indirect processing theory advanced by constructivism was counterpointed by James Gibson's theory of direct perception. Gibson argued that there are no internal representations involved. For my discussion, I focus on the more conventional constructivist approach.

2. Note that Ruskin suggested the artist should attend to their visual surroundings with an innocent eye, while Brakhage's idealized untutored eye was framed as a perceptual idyll not just for filmmakers or artists, but for all people gifted with vision.

3. Kelly's comment was originally made in reference to Brakhage's extended version of *DSM*, titled *The Art of Vision*.

4. Brakhage may, in fact, have been extending a long-lost tradition. Lewis-Williams and Dowson speculated in their article 'The Signs of All Times' (1988) that entoptic vision served as the basis for images in Palaeolithic art. Richard Bradley made a similar claim in 'Deaths and Entrances: A Contextual Analysis of Megalithic Art' (1989).

5. Re-creation available at http://25.media.tumblr.com/tumblr_lo39gbBisN1qao6oao1_500.png (accessed 13 February 2014).

6. Re-creation available at http://upload.wikimedia.org/wikipedia/commons/d/df/Purkinje_Tree_BM.jpg (accessed 13 February 2014).

7. Taken from 'Avant-Garde Filmmaker Stan Brakhage' clip, available at http://www.youtube.com/watch?v=EFDQfHvyzGI.