

## **Motion Pictures, Mental Imagery, and Mentation**

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My main concern in this essay is the matter of "mental images" (e.g. dream, memory, thought, hypnogogic/hypnopompic, hallucination, fantasy, etc.), especially how such imagery informs motion pictures. Given a trichotomy of three major-genres in film (Fictive Narratives, Documentaries, Experimental), I will contend that mental images are found far more frequently in the Experimental category where they are addressed with such sophistication that they can provide heuristic surrogates of these insubstantial modes of mentation. My main example of this filmic focus on mental imagery will be the remarkable work of Stan Brakhage who has realized scores of films (over a period of four decades) designed as simulacra of what Brakhage, himself, has termed "closed-eye vision."

### **Classical Film Theory & Behaviorism**

In 1964, Robert Holt published an essay in the *American Psychologist* entitled "Imagery: The Return of the Ostracized." Holt's article was a celebration of a remarkable paradigm shift, an end to what B. R. Bugelski described as a "hiatus in imagery research from the 1920's through the 1950's." (Bugelski, 1971, 51). Whereas the early psychology of Freud, James, and Jung was greatly predicated upon personal and

patient phenomenology of mental images, Holt's use of the word "ostracized" is apt and hardly hyperbolic. Recall Freud's devotion to dreams, James' exploration of mystical states, and Jung's fundamental concept of archetypes--all rich with diverse (and distinct) kinds of mental images. Peter Sheehan describes what displaced this seemingly intrinsic cognitive concern in his 1972 preface to *The Function and Nature of Imagery* (Sheehan, 1972, xiii):

In the very early days of psychology the mind occupied the center of the stage and mental imagery was one of our most important concepts for explaining and understanding human behavior. The break between structuralism and functionalism took place, and Watson stepped forward and began modern psychology. Fathering behaviorism, he argued against the mind, and imagery was virtually relegated to the status of the nonexistent. Imagery was translated by Watson into muscular contractions and became suddenly a muted concern of the past. It was not too long, however, before neo-behaviorism took hold and Watson's hard line softened. Within the new framework cognitive phenomena were viewed as real and genuine concerns of psychology. The new ideal was to recognize the meaningfulness of concepts like "imagery" but to talk about such terms only after they had been introduced by operational definitions from a

physicalistic meaning basis. From the 1930's to the 1950's, when methodological behaviorism came into full force as a framework of thinking, leading behaviorists such as Hull and Spence essentially argued "there is behavior, that is all."

Curiously, classical film theory seems marked by the same behaviorist premises, especially if one correlates dates. For example, Sergei Eisenstein, writing as late as the early 1930's, enthusiastically compared his beloved "montage" to Joyce's "inner monologues" in *Ulysses*. In Eisenstein's *Film Form* chapter, "A Course in Treatment," he recalls his never-shot Paramount Pictures treatment for Theodore Dreiser's *An American Tragedy*, especially protagonist Clyde Griffiths' "feverish race of thoughts," his manifest stream-of-consciousness during the crucial boat-incident (Eisenstein, 1999, 105):

What wonderful sketches those montage lists were! Like thought, they would sometimes proceed with visual images. With sound. Synchronized or non-synchronized. Then as sounds. Formless. Or with sound-images: with objectively representational sounds.... Then suddenly, definite intellectually formulated words--as "intellectual" and dispassionate as pronounced words. With a black screen, a rushing imageless visuality. Then in passionate disconnected speech. Nothing but nouns. Or nothing but verbs. Then interjections. With zigzags of aimless shapes, whirling along

with these in synchronization. "Then racing visual images over complete silence."

In contrast, Siegfried Kracauer's 1960 *Theory of Film* rejects "experimental film" because of its affinity for mental images, which is clearly consistent with Kracauer's core premise that film is a "medium which gravitates toward the veracious representation of the external world." (Kracauer, 1960, 79) I agree that experimental film is indeed characterized by an affinity for mental images. Thus, I am not contesting Kracauer's understanding. Rather I am presenting it as tautological: a remarkably behaviorist equation of reality *per se* with what Kracauer calls "camera reality." In keeping with this lemma, Kracauer's concept of "uncinematic content" includes what he terms "conceptual reasoning." Kracauer's argument is not one of verisimilitude; rather it is one of tautological proscription (Small, 1980, 3; Kracauer, 1960, 264-65):

First, *Theory of Film* equates conceptual reasoning with words, thus closing the door to the notion of mental images as devices of thought: "Conceptual reasoning must be verbalized." Second, Kracauer argues that this "alien element" (i.e., conceptual reasoning) is best conveyed in a "behaviorist sense" [*sic*]. I believe it is clear that Kracauer's position espouses the behaviorist psychology that had been academically established by the time of his writing. Further, and more important, this reflects a metaphysical position that

begins by admitting the difficulty of examining mental images and ends by denying the very existence of such activity. And if this conclusion is consistent with Kracauer's belief, certainly for him film need be about more serious tasks than the rendition of nothing.

But (again) just four years after *Theory of Film's* publication, Holt celebrates the end of the behaviorist ostracism of mental imagery. Again, correlating dates, precisely a decade later Christian Metz's *Language and Cinema* is translated into English and published by Mouton Press. From *Language and Cinema's* cinesemiotic regard, mental imagery proves (again) acceptable for film theory. Metz begins the passage quoted below (Metz, 1974, 14) while considering film as "a 'multi-dimensional' phenomenon."

Some of its elements are of interest to psychology: the psychology of perception (the film as a perceptual and spatio-temporal 'Gestalt', monocular or binocular relief--three dimensionality--the projection of color by the mind in black and white films, retinal after-image, the 'phi effect', 'intermittent light stimulation', the role of maskings and movements, filmological studies with electroencephalograms, 'screen effect', etc.); cognitive psychology (experiments on the comprehension of film by children, peoples unacculturated to the cinema, variously

pathological subjects; the film as a test of level of intelligence; the role of short-term memory and rapid restructuring of the field of perception in the comprehension of a chained sequence, etc.); psychology of emotion (the film as projective test, projection and identification, affective participation in the unfolding of the film, etc.); psychology of memory (how are films remembered, and for how long); and of course psychology of the imagination (the film between the real and the imaginary, between the dream and the spectacle, between the nocturnal dream and the day dream, the problem of the 'impression of reality' in the cinema and more generally of the 'imagination', in a Sartrean sense), etc. It should be borne in mind that there have been studies (and sometimes in great quantity) devoted to all of these topics and more, and that the discipline known as *filmology* has, for the most part, concerned itself with the study of the film with methods proper to psychology, experimental and social psychology in particular. It is precisely in this area that it has achieved the most precise results.

### **Categories of Mental Images & Motion Pictures**

To be sure, the depiction of mental imagery can be seen as part of film from its earliest days. For example, Edwin S. Porter's *Dream of a Rarebit Fiend* (1906) attempts to construct surrogates for what is perhaps

the best known mode of mental imagery: the dream. Dreams can be considered a commonplace subject throughout film history, extending into the narratives of broadcast television, television commercials, etc. Their inclusion is transgeneric and in most cases no real attempt is made to imitate the formal qualities of actual dreams. More typically, dreams are introduced by some cliché like the "watery dissolve" and then proceed with the same cinematography and editing that mark a given film's capture of external reality. The generic exception to this disregard for mimesis is experimental film. From its origins in the European Avant Garde (c. 1921-1929)--especially in the category of surrealism, predicated as it is upon André Breton's doctrinaire insistence for the "omnipotence of dreams"--experimental film's attempts to literally "re-present" the aesthetic stuff-and-substance of the insubstantial, fleeting phenomenology of dream states is exceptional. Consider just two 1927 French Surrealist films: Dulac's *Seashell and the Clergyman*, which employs prismatic lenses and subtle superimpositions to help capture the aesthetic of dream imagery, and Dali and Buñuel's *Andalusian Dog*, with its *non sequitur* (though otherwise seamless) editing to replicate dreaming's special crazy-quilt shuttle through space and time.

But dreams are only one type of "altered state of consciousness," informed by mental images. By definition, mental images are perceptions *without* external stimuli. Further, as I have contended in *Direct Theory: Experimental Film/Video as Major Genre* (1994) one of the eight

characteristics of this major-genre is "a penchant for the phenomenology of mental imagery."

Perhaps both in contradistinction to and in doctrinaire defiance of [Kracauer's] realist proscription, experimental production has almost always provided a place for an artist's exploration of dreams, reveries, hallucinations, hypnagogic imagery, etc....While we cannot say that all experimental production chose to exchange the reproductive school's emphasis upon external vision for what Stan Brakhage has called "closed eye vision," its penchant for experiences independent of external stimuli, for surrogates of mental imagery is so much greater than fictive narrative's or documentary's that the difference is another matter of kind rather than degree.

While there are a score of post European-Avant-Garde experimental artists who mark the history of experimental film due to their address of mental images (e.g. Jordan Belson, Barbara Buchner, Will Hindle, Oscar Fischinger, Bruce Conner, Maya Deren, Curtis Harrington, Norman McLaren, James Whitney, and Bill Viola), there are a number of reasons why Stan Brakhage can provide a *pars pro toto* selection. For one thing, Brakhage typically has total control over all production factors. Operating acollaboratively, all scripts, direction, cinematography, editing, and often distribution of his films come from his own hand. Such extensive

control rules out what might be termed "collaborative contamination."

Brakhage simply never has to compromise. Second, Brakhage's career is one of the longest in experimental film, and his vast tally of productions is often devoted to "vision." Third, not many experimental artists also write theory. Hans Richter, Maya Deren, and Norman McLaren did, but Brakhage's writings are far more extensive and are clearly pointed at our concern with mental images and film.

Brakhage's early writings are better known due to a collection published by editor P. Adams Sitney for a special *Film Culture* issue (1963) entitled "*Metaphors on Vision*." The following passage is the most quoted:

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 in perception.... Suppose the Vision of the saint and the artist to be an increased ability to see--vision. Allow so-called hallucinations to enter the realm of perception...accept day-dreams or night dreams...even allowing that the abstractions which move so dynamically when closed eyelids are pressed are actually perceived.

For contemporary cognitive and perceptual psychology, many of Brakhage's "closed-eye vision" images are currently named and

categorized. These would include afterimages, meditation imagery, hallucinations, dreams, memory, eidetic images, thought images, hypnopompic/ hypnogogic imagery, and entoptic images (i.e., closed-eye percepts of "floaters," actual optic debris, not a true mental image).

Brakhage's *Prelude to Dog Star Man* (1961) is a direct catalogue of such mental imagery. Just under thirty minutes long, *Prelude* begins in both blackness and silence. (True to Brakhage's devotion to the visual, the silence is retained throughout.) The blackness is repeatedly interspersed with striking surrogates for closed-eye vision. Some images are like dreams (indeed Brakhage himself "reads" *Prelude* as dreamlike); others have the ephemeral clarity of hypnogogic imagery (i.e., mental images, usually brief and rapidly replaced, that preface the actual dream state).

Employing cameraless constructions (Brakhage actually draws and paints on individual frames or groups of frames to imitate the forms of his own mental imagery), distortion lenses, or superimpositions; rushing from macroshots of snow to cosmic shots of the sun to brief memory-like images of lovemaking; rich with abstractions that paradoxically play at the representation of stimulated optic-nerve patterns or entoptic "floaters," *Prelude* quietly mounts image upon image, blackness to pure color to "distorted" representations, without any dependence upon the Hollywood narrative's popular appeal.

Actually, I was surprised to learn that Brakhage seems not unaware of the technical terms, of the "scientific" categories of mental images. In

his *Brakhage Scrapbook: Collected Writings 1964-1980*, he alludes to an argument he had with P. Adams Sitney years ago (Brakhage, 1982, 180). Sitney is at once one of Brakhage's most committed critics and the editor responsible for "Metaphors on Vision." It seems that in spite of all this admiration and (valuable) publicity, Sitney could not grasp Brakhage's explanation for his handpainting. Now, on one level, handpainted exposed film frames (or clear and black leader's frames) are an extension of the cameraless animation begun by Len Lye and Norman McLaren in the 1930's. However, the manner in which Brakhage employs this technique really makes it distinct. First, he is wont to engage in meticulous constructions: "I've been working two years now and have three seconds done," he wrote in 1967.

For years I've baked film, used high-speed film and sprayed Clorox on it so as to bring out grain clusters. You might say it's inspired by impressionism, but it is a great deal more contemporary than that. I have been trying for years to bring out that quality of sight, of closed-eye vision. I see pictures in memory by the dots and moving patterns of closed-eye vision--those explosions you can see by rubbing; there's a whole world of moving pattern. (Brakhage, 1982, 115)

In a spontaneous attempt to demonstrate the verisimilitude, the powerful mimesis of his technique, Brakhage repeatedly asked Sitney just to close his eyes and witness what manifested (i.e., to explore his own closed-eye

vision). Brakhage recalls that Sitney, "simply did *not* want to close his eyes and see hypnagogically [*sic*] so that he would have some sense why I was handpainting films a frame at a time." (Brakhage, 1982, 180) I'm not sure if Brakhage's painstakingly crafted handpainted material is all precisely characterized by the classification "hypnagogic," but I would suggest that this very question becomes an empirical question of potential interest and value to perceptual psychology.

### **Mental Images & Mentation**

I have chosen an old word, "mentation," here to avoid question begging. In his 1989 study, *Mental Imagery: On the Limits of Cognitive Science*, Mark Rollins first reviews "the crisis" that the very issue of mental imagery brought to behaviorism, then relates that crisis to cognitive science (Rollins, 1989, xiii):

The reference to mental imagery here is not coincidental. In the past few years, a debate has arisen among cognitive psychologists about whether--or in what form--images might play a role in cognition; and, as these remarks suggest, the matter has become a kind of crucible for defining cognitive science as a science.

Rollins examines and argues against "two competing views of imagery." One view, "descriptivism, argues that all cognition requires a linguistic format." (Rollins, 1989, xiv) In my own research on cognition I have

had to deal with the remarkably logocentric premises of this view. (In my experience, it looms large in "communication theory" as well as Kracauer's *Theory of Film*.) Personally, I am far more persuaded by Rudolf Arnheim's 1969 study, *Visual Thinking*, where he argues that, "In sum, every pictorial analogue performs the task of reasoning." (Arnheim, 1969, 148)<sup>1</sup>

As early as 30 years ago, cognitive psychologist Mardi Horowitz acknowledged the problems attendant upon one's phenomenology of "image formation" and the limitations of the introspective report. Still, verbal "description" is valuable (Horowitz, 1970, 3).

A person can describe an image in many ways, including information about contents, vividness, clarity, color, shading, shapes, movement, foreground and background characteristics, and other spatial relationships. Furthermore a person can often tell how the image entered his awareness, its duration, associated emotions, the relationship of the image to objects in the external world, efforts to change or dispel it, and the sequential or simultaneous arrangement of a series of images.

Equally important is Horowitz's insights in his chapter, "Modes of Representation in Thought." In keeping with what the filmmaker and film theorist Eisenstein envisioned forty years earlier as he sought to script a treatment for *An American Tragedy*, thought is an interrelated complex of "images of various sensory quality, and implicit ideas, feelings, or

predispositions. Examination of visual images alone would be misleading and would not result in an understanding [of the full] train of thought or the utility of visual images in the thought process (Horowitz, 1970, 69).

Thus, a cognitive approach to motion picture images and mentation could address what I've come to call "the clarity continuum" (cf. Horowitz's "vividness") along with what both Horowitz and classic film theory address as "duration." Dreams, for example, seem quite vivid in contrast to memory-images; dream imagery is also marked by high duration, while it is a rare type of memory image, eidetic imagery, that can be maintained in "the mind's eye" for more than a few seconds (say less than c. 100 film frames running at 24 frames per second). In contrast, hypnogogic images, while very vivid, are characterized by their brevity, their fleeting manifestation, "bracketed" in a pre-view and post-view of pure black (cf. black leader). These comparisons are provisional, but drawn from three sources: my own filmmaking and phenomenology, research by psychologists like Horowitz, and motion picture surrogates by artists like Brakhage.

I recall, here, a question from a colleague seeking to relate such mental imagery to ecological parameters: "Why do we have the capacity for mental imagery at all? Most of our capacities can be shown to have had adaptive value at some point in our evolutionary history, or they are accidental byproducts of some adaptive capacity or other. Exactly what does mental imagery allow us to do?" (Anderson, 2000) These are not

easy questions. While it is well known that deprivation of dreaming results in transient psychosis (perhaps subjects begin to meld their waking and dreaming states), how does dream imagery serve human survival, especially when over half of us just do not recall our dreams (though R.E.M. patterns reveal that we all do dream)? Perhaps there is comparable inattention to other modes of imagery, which would help explain why the very matter of mental images has experienced on-again-off-again attention by psychology. There is a certain discipline, a certain reflexive (the metaphor is quite filmic) focus required by those seeking to regard the stuff-and-substance of their mentation. Rollins addressed this "possibility" under his section on "self representation."

It has sometimes been said that seeing pictures depends upon the possibility of attending simultaneously to the medium and to the object of representation; and, further, that this possibility accounts, in part, for the effectiveness of the picture and thus for our pleasure in seeing it, to the degree that the artist has exploited the feature. In certain respects, a similar possibility results from imposing the formality condition on mental pictures; and it would be an interesting point in favor of the theory if one could show that the imager could, himself, exploit the feature (though not necessarily consciously) for pleasure or for some related but more complicated end. Something like this seems to occur, one

might say, in dreams, fantasies, and similar phenomena.

It would be an interesting and complex task, beyond the scope of this treatise, to develop a complete and systematic theory of the role of imagery in those processes. However, I wish to focus on the way in which a conscious attention to one's images themselves can constitute a mode of cognition. (Rollins, 1989, 127)

I have found that mentation devoted to solving certain problems (what I've called "thought imagery") often is spontaneous in its use of picture-like cognitive entities. For example, were I to address the problem of how and where to construct a secure yet accessible "door" for an inside and outside pet, I discover not only the vast advantage of imagery, but also how commonplace and frequent is its employ in problem-solving. Oxford's Roger Penrose, Professor of Mathematics, addressed this issue in regard to mathematical matters for his 1994 study, *Shadows of the Mind*: "...[I]t turns out that insights which are geometrical are frequently of particular value towards mathematical understanding. Thus, it may be instructive to ask what kind of physical activity is actually going on in our brains when we visualize something in a geometrical way."

Indeed, in one's mind's eye, when one views some *actual* fixed structure, one seems to construct some mental model which persists unchanged despite continual movements of head, eyes, and body which entail that the retinal images are

continually shifting.... More generally, one's mental images need not at all have this literally 'visual' character, such as when one understands the meaning of an abstract word or recalls a piece of music. (Penrose, 1994, 56-59)

Penrose goes on to criticize what seems to be a currently fashionable premise in cognitive research, namely what John Searle calls "...one of the worst mistakes in cognitive science. The mistake is to suppose that in the sense in which computers are used to process information, brains also process information." (Searle, 1992, 223) (From my own surveys of classic and contemporary positions on the nature of mentation, a tendency to construct metaphors based on the newest recording devices--for example, holograms in the 1980's--seems to plague explanatory efforts.) To be clear, my particular position in this present chapter is not to equate mental images with motion pictures, even metaphorically, but to contend that certain motion picture renditions of mental imagery are semiotically closer to special modes of mentation than are, say, linguistic sentences or mathematical formulae. Searle's "worst mistake" is often termed the "computational" model, and Penrose's position seems quite compatible, as when Penrose himself states that his "...belief that our actual acts of visualization must indeed be non-computational is an inference from the fact that *other* types of human awareness *do* seem to have a demonstrably non-computational character." (Penrose, 59)

Even more specific to an *ecological* approach, Penrose directly asks the question: "What about the role of natural selection?"

It would be very reasonable to suppose that the selective advantages that our ancestors enjoyed were qualities that were valuable...and, as an *incidental* feature, turned out, much later, to be just what was needed for the carrying out of mathematical reasoning. This, indeed, is more or less what I believe myself. According to a view of this kind, it might be the general quality of being able to *understand* that Man has somehow acquired, or developed to a high degree, through the pressures of natural selection. This ability to understand things would have been non-specific, and it would have applied to Man's advantage in many ways. The building of shelters or mammoth traps, for example, would merely be specific instances where Man's ability to understand things generally would have been invaluable. Nonetheless, in my own opinion, an ability to understand would be a quality by no means unique to Homo sapiens. It might also have been present in many of the other animals with which Man was in competition, but to a lesser degree, so that Man, by virtue of an increased development of an ability to understand, would have obtained a very considerable selective advantage over them. (Penrose, 148-49)

Penrose seems to be making a good case for an ecological explanation of mental imagery. Just as we humans have a visual system with which to gain information about the external world, we also have the capacity to generate visualizations from within--directly. For example, we experience images that result from our capacity to visualize a situation and our possible actions in that situation. This is a very useful capacity: a creature that can visualize possible situations and possible actions is clearly superior to a creature that can only see what is immediately before it. Such a capacity, employed in the present, makes it possible for us to visualize situations that we may transform into film, into motion pictures, which can be widely shared with others.

### **Conclusion**

As I come to conclusion in this essay, I find myself especially attuned to my personal mentation and am struck by how I often directly truncate, say, a given memory image when that memory presents material that I realize is unpleasant or better left forgotten. I find myself actually uttering a voiced sound, often accompanied by body movement, to stop the imagery. Perhaps the reason mental images have proven problematic for psychology is not that they lack valuable resources for mentation, but rather that they are potentially uncomfortable when consciously attended. Here I recall strategies for another type of imagery, another type of what Charles Tart called "Altered States of Consciousness" (Tart, 1969). These are the often troublesome images that arise during states of meditation,

images as ancient as our planet's earliest writings, images that such philosophical/psychological/religious disciplines like Buddhism have provided helpful hints to mitigate when the mediator seeks to remove or replace such transgressions against the "right mindfulness," which is the "proper" goal of meditative practices, images deeply mystical (a term employed here in its proper sense of the belief that humans can experience "ultimate reality," or God directly), images so non-verbally direct that William James proposed, as the first of his four "marks" of mystical experience, their ineffability (James, 1978, 371):

The handiest of the marks by which I classify a state of mind as mystical is negative. The subject of it immediately says that it defies expression, that no adequate report of its contents can be given *in words*. It follows from this that its quality must be directly experienced; it cannot be imparted or transferred to others. [my emphases]

But even in this most esoteric image category, a number of west-coast United States experimental film artists, especially during the 1960's and 1970's, sought to construct works which would imitate the mental images they experienced during Yoga exercises or Buddhist meditation. Jordan Belson's work is perhaps pre-eminent in this regard. In an interview with Gene Youngblood, Belson explains (Youngblood, 1970):

I reached the point [in my meditation] that what I was able to produce externally, with the equipment, was what I was

seeing internally. I could close my eyes and see these images within my own being, and I could look out at the sky and see the same thing happening there too. And most of the time I'd see them when I looked through the viewfinder of my camera mounted on the optical bench. I've always considered image-producing equipment as extensions of the mind. The mind has produced these images and has made the equipment to produce them physically. In a way it's a projection of what's going on inside, phenomena thrown out by the consciousness, which we are then able to look at.

Again, recall that Kracauer's *Theory of Film* is based on the premise that cinematic constructions for surrogates/simulacra of insubstantial phenomena lack the intrinsic verisimilitude and accuracy of cinematic captures of external phenomena. Wrote Kracauer, "All this means that films cling to the surface of things. They seem to be more cinematic the less they focus directly on inward life, ideology, and spiritual concerns." (Kracauer, 1960, XI)

Perhaps Belson himself came to agree with this premise. During the 1980's he mysteriously withdrew all prints of his work from distribution; worse, he "destroyed the negatives" (Kemp, 1991). In fact, the Belson prints we screen today remain only due to previous purchases for private collections.

With Belson's striking *mandala* imagery,<sup>2</sup> as with James' (1902)

"ineffability" we come to the gist of the problem for cognitive science and mental imagery--the clash of phenomenology and empiricism, plus the resource of the motion picture's attempt at resolution. As Viktor Shklovsky said, "Art is thinking in images." Thus I can only conclude by reintroducing a rare (indeed obscure) verb that dates back at least as far as the 1630's writings of Ben Jonson: "problematize." The O.E.D. defines it tersely: "to propound problems." That is, to put forward problems for consideration; to set them out, first, as a problem (generally overlooked), then to encapsulate, formally, its attendant ramifications. The unique interrelationship among motion pictures, mental images, and mentation is a problem which attracted my attention long ago. Now, in the framework of ecological psychology, I ask "What constitutes the 'information' of mental images? Can motion pictures re-present some of the same information as mental images?" Perhaps this essay will spark others' interests and connect me with others' studies and ecological concerns which address "motion pictures" as we enter what will surely be the vast change and exchange of film/video's simple devices for the awesome future of the digital revolution. Digital devices can and will change what this essay has problematized. On the empirical side, PET-scans and MRI's provide but a bare glimpse of genuine mapping and a truly causal understanding of mentation. Reciprocally, the artistic side will at once be better able to imitate mental images, partly due to such empirical gains but equally (if not more so) due to the already immense digital resource for

creating these curious mental phenomena.

### Notes

<sup>1</sup> For an elaboration of Arnheim's argument and conclusion in relation to motion pictures, see Small, 1996.

<sup>2</sup> *Mandala* structures can be readily regarded as ubiquitous. Their often abstract (but at times representational) symmetry and concentricity have literally ancient associations with religious art and meditative practices not only within Belson's Buddhism but other religions as well. Consider the *T'ai Chi* of Taoism, the star of David, the arabesque patterns in Islamic rugs or mosque tiles, most Amerindian sand-paintings, the Christian cross or the Rose Window in Chartres Cathedral--all exhibit Arguelles' basic structural properties of a center, symmetry and cardinal points which help characterize these devices. Thus it was that Carl Jung came to consider the form as quintessential archetype: "The archetype of wholeness...the schema for all images of God. See Jose and Miriam Arguelles' *Mandala* (Berkeley: Shambala Press, 1972) as well as C.G. Jung's *Mandala Symbolism* (Princeton: Bollingen Series, 1972) p. 4.

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