

# *FIELD OF VISION*

*No. 3*

*Winter 1977-78*



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FIELD OF VISION is edited by R.A. Haller, with assistance from John Burchfield and Elizabeth Schilling. It is a publication of Pittsburgh Film-Makers Inc, a non-profit, tax exempt center for the making, study, and exhibition of cinema, video, and photography. Pittsburgh Film-Makers Inc. (PFMI) is supported in part by grants from the Pennsylvania Council on the Arts, the National Endowment for the Arts, and by area foundations. All correspondence relating to FIELD OF VISION or to PFMI should be addressed to P.O. Box 7200, Pittsburgh, Pa. 15213.

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Cover: Pittsburgh film-maker Roger Jacoby speaking at the Museum of Art, Carnegie Institute, 1977.  
Photograph by R.A. Haller

Editor's Note

With this issue FIELD OF VISION will begin to appear at least three times a year, hopefully quarterly. This issue is also larger, chiefly because of the addition of the section Reviews, Notes, and Notices, which is an attempt to offer coverage of especially interesting events and exhibitions in the period just prior to the appearance of the magazine.

While the primary focus of this magazine will continue to be on writing by or about Pennsylvania writers or artists, it is also open to contributions from outside the state—particularly on subjects of importance that have been inadequately treated elsewhere. The contents and contributors to this issue well illustrate this direction.

The name of this magazine does not specify one particular medium, such as film, photography, or video. The "field" was deliberately left open, limited only to what enters the eyes, or what can be described as "vision." The evolution of twentieth century media—especially the visual media—is still an open-ended process, a continually surprising process. FIELD OF VISION is still looking for those surprises.

—R.A. Haller

## Quest for the Ecstatic: The Films of James Broughton

By Robert Lipman

I am thinking of James Broughton's brief appearance in his film, The Bed: he sits naked as a flame and crosslegged before a snake, the consort of the goddess to whom Broughton is praying, and whose vast lap is the bed upon which the world's progeny tumbles in its birthing, copulating, sleeping, dying, and other rounds of pain and pleasure. Broughton's reverent mantic posture is uniquely his as an artist. He has come to be archpriest of the underground independent cinema, one who has dedicated himself to a god, sanctifying and purifying himself by rituals solemn, submissive, and ecstatic. As priest he is a poet charming, evoking, substantiating the god's power. His films speak in a clear sexual voice, hot and holy and joyful, calling, if not for a new religion, then for new ways to celebrate the old ones.

He has recently published Seeing the Light, a breviary of filmmaking, an Instruction in the Faith, a handbook for life in the Brotherhood of Light. It contains catechisms, vows, rituals, duties, a short mass, proverbs, and hymns. And more: koans, persees, paradoxes, anecdotes, definitions, and extended metaphors as mystically laden as a medieval tapestry. He approaches cinema, its makers, its importance, its making, like a wrestler loose and eager, throwing sinewy, agile, cunning holds around it as tight as a vigorous lover's. His passion is always abundant and illuminates all he looks at, is the very light he sees with and searches for.

"The ecstatic has been my faith and my adventure," he writes at the end of Seeing the Light. (He walks the same path as Walt Whitman—as wide as the possibilities of passion are numerous—and few enough have followed upon it.) The ecstatic reveals the Human Form Divine, whose varied images Broughton clarifies and substantiates in The Golden Positions, and whose life, death and rebirth form the myth animating human consciousness. Broughton's achievement lies in this myth telling, the hieratic job of making the story of the divine human both miraculous and believable.

Just as the birth of the divine human comes from the life-granting hand of the Great Goddess, so its death is at the hand of the same Mother. In Broughton's early film Mother's Day, Mother is the black Goddess, glorious in her full and blasting powers. Imperious, beautiful, narcissistic, and jealous as an evil queen in a fairy tale (that is, worthy of the most royal love, of which neither doddering Dad nor toddling Son are capable), she casts the gloomy enchantment of her mind over her children by invoking the arid word "lovely." This word binds them in its iron clasp, and they become bloodless, their spirits constrained and undeveloped, like the feet of a Mandarin princess, as their bodies grow. They are adult-like children, gnomish, their faces, bewildered by their separation from sensuality, are stagnant and sour with unacted desire. They seem to speak in whispers, their actions and play are strangled into stiff repetitive gestures.

In the films that follow Broughton sets out to break the grim spell of Mother and to reinstate the fecund word "love" by rediscovering and regaining delight in the body. The passage from Mother's Day to Loony Tom must have crossed the sexual seas forbidden by Mother and descended into dim grottoes (with what trepidation did Adventurous Jimmy arrive in the Big City!). The word "adventure" recurs noticeably, for when pleasure is forbidden and punishable, gratification is an adventure as dangerous and delirious as murder. Tom is the quick image of joyous unfettered sexuality. He is completely unmindful (a naughty boy who didn't mind his Mom) of propriety; he is as carefree as the people in Mother's Day were careworn, as driven and undaunted as a spermatozoon. Tom is loony to all the Sane Toms (of both sexes) resigned to their withered sexuality. The shifty eyes of the secretly desirous see him as a sex maniac, but behind those eyes he is cherished and envied. To Broughton Tom's sexuality is a bestowal of life, and Tom is a resplendently shameless satyr inhabiting a grove empty of pagans.

Loony Tom reappears in The Pleasure Garden as Sam from Californiay who is "lookin for a gal as sweet as Mom." Irresistible Mother! Others too are searching for someone to love as they roam through a vast park weedy and rank with neglect. Love, equally neglected, is off the track. The villains here stand clear: they dress in black, ride in a hearse, arrest couples. These melancholic scoundrels are opposed by a fairy godmother and her magic shawl which grants each lover's wish. The mortician's party captures the dangerous shawl and separates the couples. But after a tug of war between the two sides the shawl is regained and the garden returns to the pleasures of its visitors. All this is light, funny, straightforward mummery. But comedy is profound, for it is the personified drama of the cycle of seasons: the story of the temporary victory and threatening rule of darkness, winter, and death, and of the eventual rebirth and triumph

of light in the green life of Spring. So The Pleasure Garden should be shown at festivals of the vernal equinox as part of a ritual of planting fields, to coax and celebrate in ourselves the return of light and life and love by hymning the Pleasure Guardian.

Love is not only a pleasure of two by two, as the song goes at the end of this film, it is also the consummation of the soul's union with the Other whom we constantly seek while constantly standing in its presence. The image of this union is the central and continuing creation in virtually all of Broughton's films. The multitude of people in The Bed show merely the visible edge of the infinity of our notions of pleasure. Their massive eagerness to join in the bed's secret festivities rebukes any demon who would prohibit the most outlandish coupling, for in even the most outrageous or dismal clasp blossoms an exalted union. In that union we fly beyond the joining pronounced in pledges or described by encircling flanks: the self-dissolving voluptuousness of sex metamorphoses a lover into his beloved, his angel, his contrary, his divinity. This marriage is sacred, for it requires the proper aspects of stars and planets and the proper assignment of elements; then the godhead is revealed. That is, Nuptiae is more than the record of a wedding. It is the sign of the conjunction of contraries made flesh, the cosmic niche for human affairs, the restoration of a natural balance of opposites. And similarly the couple in The Golden Positions seek through the knotty interlocking of their bodies a return to the One they were at the beginning of the film.

Broughton's recent film Together is a precise icon of the strife and the final union of the dualities contained in the self: all the attractions and repulsions, the intricacies of self-love and self-hate, the fluxions of his real/unreal, male/female self. The final image, Broughton as silvery as his angel, gains repose not through extinction or repression of contraries but, it seems, through their acceptance and embrace. In contrast, the repose that the grown man must struggle for is achieved effortlessly by the child in This Is It. In fact, the adult's struggle is initiated by the memory of childhood. The poem and the title of the film transmit their authority by the splendidly effortless gestures of the child: he is absorbed in animal attention, his understanding is all sensual in a direct and certain connection to life. This precious state is a birth gift, which in this society lapses along with innocence when the senses become dull. This Is It, as indeed do all of Broughton's films, recalls the sensuality that we have been taught to deny and forget. It recalls us to the warm blood that once irradiated our bodies and connected us to both Earth and God.

The tale of the struggle to return to this initial harmony is told in Dreamwood. Its hero is discontent with merely the memory of a freer self; a photograph reminds him of what he is not, and so he destroys it. This act immediately sets him upon his journey, a night sea journey into his unconscious, whose inhabitants are the threatening and powerful echoes of his own polymorphous self. His encounters with these figures follow the pattern of the thousand-faced hero of Joseph Campbell, and they are well elucidated in Sitney's Visionary Film where he discusses Dreamwood. The hero's adventures culminate in his copulation with the Earth Mother. This has been preceded by several humpings with her human personification, the projection onto a woman of the sexual force of nature (a mythic role played by Margo St. James, the exact contemporary mythic counterpart to the Harlot Priestess, this probably being the only instance in film history of archetypal casting). He has been prepared by these energetic couplings for direct contact with the Great Goddess herself. He has sought and embraced what he feared, discovering his courage as he accepted his inevitable fate, as he submitted to becoming a hero. By entering experience as "Adventure, not predicament," one's stance is transformed from coward's to hero's. In adventure, Broughton knows, we live at the keen extreme of our powers, always farther than we thought possible to go, and enter the presence of the generating powers of all life. Thus the hero deserves the love of the Goddess, for none but he can achieve it. And so he returns at last to what he had been in his own photograph, an exultant figure whose body has harmoniously entered the processes and cycles of the world.

Testament is the summary of Broughton's own quest for the ecstatic. It is the recollection of who he has been, of the selves lost and gained as he followed the direction of his voices, of the multiple god within him who unfolded his life. I suspect that all of us at some early moment of our lives, when everything—stones, frogs, leaves, ourselves—seemed God-filled, vowed to attain sainthood. And even now we labor toward that holy goal of bringing God to birth within us, though it be only in the locked chamber of the soul where we stroke our vices. But Broughton proclaims his Godhood in front of everyone; Testament is the writ of the signs of the revealed god.

In all of his work, his films, his poetry, his teaching, and his loves, Broughton is never shy about speaking of his soul and of the God that speaks through him. He urges us with his unique passionate voice to reawaken our body's senses and pleasures, so that we too can reenter the infinite and sacred world we were born into. His touch—eager, playful, and sensuous—scrapes us clean of despair, drapes us in supernatural white, and points us toward grace.

## A Theory of Pure Film -- Part II

By Victor A. Grauer

### PREFACE to Part II

Part I of this paper established a general conceptual framework for the much more detailed and specific theorizing which follows in Part II. Readers who are more interested in these specifics, or do not have access to Part I, may skip it and begin with Part II which contains a summary of I, and is complete in itself.

Some readers may wonder why I have taken such pains over certain issues which might easily be passed over in a sentence or two. It is true that my plodding approach makes for difficult reading and my concern over certain problems may seem excessive. I can answer this objection in two ways: 1. I want to establish pure film on a firm logical base so that nothing is taken for granted--arbitrary elements may creep into the system, but, at least, if I am thorough enough, we will know exactly where they are; 2. pure film, by its very nature, presents a unique opportunity for the examination of certain basic structural issues in an unusually clear light--even if these issues were extrinsic to pure film itself, which they are not, it would be a disservice to skim over them.

I want to acknowledge an intellectual debt to Henri Pousseur, with whom I studied music composition and theory at the University of Buffalo about ten years ago. His approach to theory, which had little effect on my work at that time, has deeply influenced the development of my current theory and practice in both film and music.

I wish to acknowledge also the active assistance of Professor John Myhill of the Mathematics department of the University of Buffalo, and his assistant, Dan Soloman, who took an interest in some of the more formal aspects of my theory. We are currently working together on a computer program which should be of great value for the precise formalization of concepts which are now a bit vague.

Thanks to the great generosity of Woody and Steina Vasulka, also of the U. of Buffalo, I have had the opportunity to be among the first to use their new digitally computerized video system. This has given me the opportunity to test certain structures with relative ease without having to splice together a lot of film. More important, it has also convinced me that pure film is fully applicable to digitalized video. This, plus the fact that Dr. Myhill became interested in pure film as a means of solving certain rhythmic problems in a computer music system he is designing, has encouraged me to believe that my theory may well be much more generally applicable than I had originally guessed. I am currently working out an adaptation of the theory to musical structure specifically, and am strongly considering a very generalized version, applicable to any precisely defined time structure, to be called "tempoplastics."

### A THEORY OF PURE FILM--PART II

I have stated my intention to produce a film theory which would have its foundation in "an attempt to isolate, describe, and assess basic elements, study the way these elements are organized in themselves and in relation to each other, formulate principles of procedure based on meaningful analysis, and above all, strive to deal with each problem rigorously, in its simplest, most isolated and concrete form."<sup>1</sup>

Rather than attempt to build such a foundation on the analysis of existing master-works, films which are far too complex and problematic for my purposes, I have proposed the construction of a clear, simple, apprehensible prototype film which would serve as a more practicable basis for development. Because my terms have been defined with unusual rigor, I have been forced, through a step by step process, to systematically eliminate from this prototype everything which has heretofore been considered meaningful in film. The prototype must consist only of solid imageless frames of either clear or opaque film and can have a total length of only twenty-four such frames.

The logic behind such an extreme reductionism may be summarized as follows: 1. by doing away with the image, we minimize the extraordinarily difficult problem of interpretation; 2. the many problems caused by the tendency of the image to dominate every other filmic parameter are eliminated; 3. blank frames of clear and opaque film, projected under the right conditions, produce effects that are both contrastive and mutually complementary--each is maximally articulative of the other in a manner that is uniquely structurable; 4. a length of approximately 24 frames is necessary if we wish to relate part (the frame) to whole directly without the aid of any system.

We are now at the point where it is necessary to design a specific prototype film within the given limits. Because these limits are so unusually severe, an attempt to apply guidelines from the realm of aesthetics in any ordinary sense would appear to be futile. The real challenge in creating a film so brief from elements so simple is that it be perceptible at all.

We must be able to see it. A vague blurring sensation will not do. Nor will the banality of over-simplification. The achievement of clarity through careful attention to structure with as much complexity as that structure will permit should result in a meaningful perceptibility.

Let us begin by taking a sheet of graph paper and marking off 24 horizontal units, each of which will symbolize one frame. One could, incidentally, use 23, 25 or even 30 frames—the important thing is that one use a number small enough that the relation of each frame to the total be perceived intuitively and large enough that it be workable with a certain amount of freedom—24 is the number that was most convenient for me.

Contemplating our graphic series as though it were a strip of film, we must ask ourselves how we can achieve maximum clarity within it through an arrangement of black (opaque) and white (clear) frames. We can first eliminate some possibilities. I have already, in Part I, discussed the use of the so-called "flicker" effect produced by the periodic repetition of brief patterns. This effect can be regarded as, to some extent, analogous to certain acoustic phenomena, a kind of "visual harmonics." This is really a topic in itself, which I plan to discuss in some detail in the future. For our purposes now, flicker or periodicity of any sort must be ruled out: patterning of this kind produces secondary optical effects and "textured" effects which lie at the opposite pole from clarity; such effects work best, in any case, over longer time spans; periodicity is a systematic procedure—we are trying to avoid procedures of this type at this stage.

Symmetrical patterns may also be ruled out. In many cases they produce effects similar to those of periodic patterns, and they are equally systematic.

Random structures may be described as systematically unsystematic. These too must be avoided: like periodic patterns, they really come into their own on a large scale; within 24 frames, randomly derived arrangements are bound to give an arbitrary effect; any clarity derived from random means can only be accidental—we can learn nothing from it.

Example I on page 7, contains several examples, in graphic notation, of possible 24 frame films in black and white. Graph squares, or groups of such squares, enclosed by heavy lines stand for white frames—all other squares stand for black frames. Let us call any uninterrupted series of one or more frames of the same color a "run."

Examples I(a)—(d) are either periodic or symmetrical or both, while I(e) has a random arbitrary quality. Note the difference between the way one perceives (a)—(d) and (e). Each of the first four designs shows, at a glance, that it is organized, but the extreme regularity produces confusion—the overall impression is that of a texture—each seems part of a pattern that could continue indefinitely—the parts do not define a whole. Example I(e), on the other hand, presents a vague, weak picture, with no trace of organization—it is difficult to take in at a glance—the parts seem unrelated either to one another or to the whole. It seems obvious that our solution must lie somewhere between the over-organization of (a)-(d) and the under-organization of (e).

Example I(f) seems clearer than any of the above, if only because it contains fewer elements. Yet consider the placement of the central white run. Why is it where it is? Why could it not, say, be placed one or two frames to the left or right? As we study it, it seems to drift vaguely somewhere around a vaguely perceived center. The placement of this run is arbitrary.

Example I(g) is a great improvement. Notice how easy it is to take in at a glance. Every run is clearly differentiated from every other run. We may not be able to tell at first glance exactly how many frames there are in the left-most white run, or in the right-most black run, but the relationship of each to all the others, in terms of relative length, is crystal clear. The single white frame is placed in such a way that there is no vagueness about its position—unlike the centralized white run of I(f), it is clearly committed to the left of the space and directly related to the white run to its left. Moved one frame to the left, it would become a satellite of this left-most white run. Moved one frame to the right, it would begin to lose itself in a vaguely defined central area.

The simplicity of Examples I(f) and (g) has helped us to demonstrate some basic organizational principles. They are too simple, however, to be completely satisfactory as structures. There are not enough parts to fully achieve a meaningful whole—there is an absence of richness.

Example II, on page 7, systematically applies the principles discussed in relation to I(f) and (g) within a context of greater complexity. It represents a series of attempts to come as close as possible to an ideal structure—clear, perceptible, balanced, with as much richness as its brevity will permit. For ease of reference, each run will be numbered according to its order, reading from left to right.

Example II(a) is a first step. It is much richer than Example I(g) (containing a total of 11 runs compared to 5 in I(g)) and somewhat more clearly organized than

Example I(e). The clearest element by far is the strong contrast of length between run 10 and run 11. The area to the left of 10 is confused, however.

In Example II(b), there is an attempt at differentiation. Runs 1-5 are made more compact while 6 is expanded and 7-9 are reduced to one frame each. This has the effect of creating three clear groups of white runs, 1-3-5, 7-9, and 11, separated by two black runs, 6 and 10. While the creation of these groups enhances clarity, the central group seems weak in itself and weakly placed. It is too similar to both 1-3-5 and 11—the use of single frames especially spoils the freshness of the single one-frame run at 11. Moreover, as with Example I(f), the central group seems arbitrarily placed—the black runs flanking it, 6 and 10, consisting of 6 and 7 frames, respectively, are not sufficiently differentiated.

Example II(c) is a marked improvement in terms of both of the above problems, yet the only change involved is the lengthening of run 7 by only two frames (reducing run 6 by the same amount). The central group is now more highly characterized and, through the greater differentiation of runs 6 and 10, more clearly placed.

Examples II(d) and (e) represent fine adjustments of the central group. It seemed that this group could be more precisely placed if brought into closer proximity with the first group. The idea was to try to place the central group as close as possible to the first group without any of the former's elements becoming part of the latter. In (d), run 7 is moved one frame to the left. A possible difficulty here is that now the weak differentiation between runs 6 and 8 might create some ambiguity as to whether run 7 is still felt to be grouped with run 9. Actually the strong differentiation between runs 2 and 4 (one frame each) and run 6 (3 frames) seems adequate to isolate the first group.

The enlargement of run 7 by one frame (Ex. II(e)) in any case re-establishes the strong differentiation of 6 and 8. More significantly, it is a first attempt to respond to the fact that there have been, until this point, no white runs longer than three frames. A single run of white, significantly longer than any other, would help to strongly characterize a group and also provide a welcome balance to the single, isolated white frame of run 11.

Example II(f) responds to a slight problem posed by the symmetry of the first group. The new configuration breaks up this symmetry but also creates a new problem. Run 2 may now be insufficiently differentiated from run 6, pulling 3, 4, and 5 away from 1, thus possibly weakening the first group.

Example II(g) is the result of a more decisive implementation of the insight reflected in II(e). Run 7 is made even longer, so that the entire central group consists of only this one 6-frame run. A certain amount of richness is lost—two runs are eliminated, so that the film as a whole now contains only 9. In compensation, we now have a structure in which each of the three groups is maximally characterized. The first consists of three short runs, the second of one long run, the third of one short run. If the three groups can be unambiguously articulated, the total result ought to be clearly apprehensible.

II(h) is an attempt to eliminate any ambiguity by pulling the left side of run 7 one frame farther away from the first group. This, however, creates a situation similar to that in II(c)—the placement of the central group (now simply run 7) seems a bit arbitrary. Moreover, run 7 needs to be as long as it possibly can in order to adequately balance the single frame of run 9.

In II(i), rearranging the first group so that both black runs are only one frame each, the white runs of the group are pulled together sufficiently for run 7 to be restored to its former length without danger of any ambiguity weakening the articulation of groups 1 and 2. Run 7 is firmly placed beside group 1 without any danger of being perceived as part of it. Note, however, that, moved one frame to the left, it would risk being pulled into the orbit of the first group.

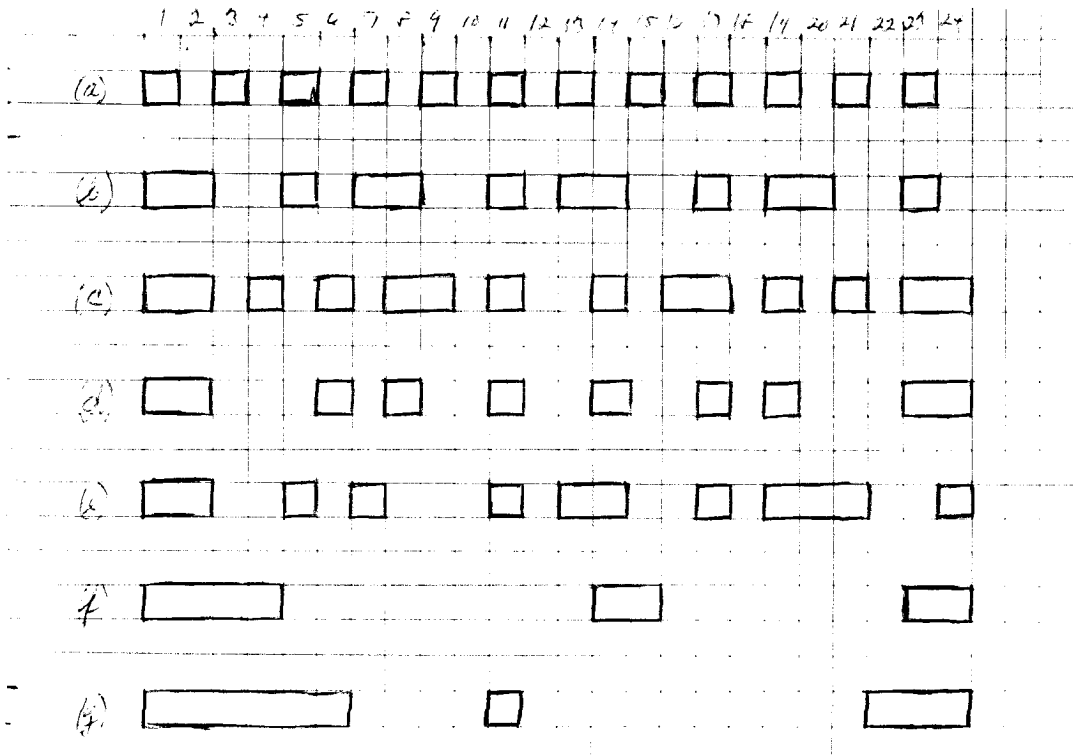
At this point it seems that there is nothing more to be done. The only possible weak point is the fact that runs 7 and 8, of 6 and 7 frames, respectively, are not sufficiently differentiated. While it is true that they are weakly differentiated in terms of relative length, this is compensated by the fact that they are strongly differentiated on a more basic level—color. If 7 were shorter, that would spoil its contrast with 9. If 8 were shorter, 9 would not stand out so clearly and might risk being grouped with 7. The fact that 7 and 8 are of opposite color is, however, more than sufficient for strong differentiation, so these measures are not necessary.

Example II(i) seems to be "clear, simple and apprehensible." It is structured precisely, according to rational procedures—all the parts relate clearly to one another and to the whole. Have we reached our goal? Is this our prototype? Before we can answer this question, we need to answer a more basic one: in what sense is this a film and not simply a spatial design?

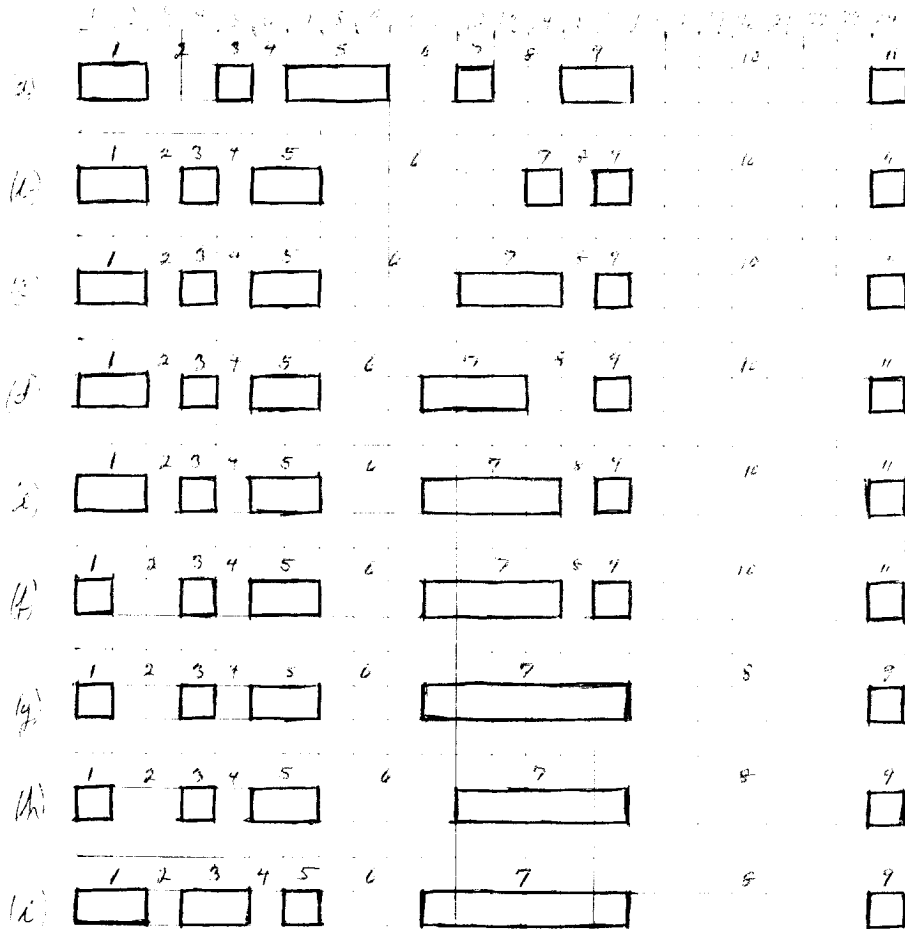
The use of a graphic procedure to "picture" a sequence of events in time is so



Example I



Example II



common that no one is likely to object to it. But there is a very real problem involved that ought not be taken for granted: though a line of graph paper has a clear relation to a piece of film strip, it is not at all clear how we might relate either a graph or a piece of film to what actually happens when the film is projected. It does seem that Example II(i) is "clear, simple, and apprehensible" as a relation of forms in space. Can we translate our spatial thinking into temporal thinking? Can we say that Example II(i) as a strip of film actually moving through a projector remains "clear, simple, and apprehensible" as a relation of events in time?

Time is regarded by many philosophers and laymen alike as fundamentally different from space. Probably the most extreme exponent of this view is Henri Bergson, who, in such works as Time and Free Will, and Creative Evolution, argues that what he calls "pure duration" is totally different from "time" in the sense that the word is used popularly or in science. Bergson attacks the scientific notion of time as, for instance, something which can be measured. He contends that this is an error stemming directly from an unfortunate tendency to "spatialize" time. Interestingly enough, what Bergson called "cinematographic time" was the perfect model for what he felt was wrong with the usual view of time, precisely because cinema translates the space of the film strip into a synthetic, and, for Bergson, completely misleading, time experience.

At almost the opposite pole from Bergson is the contemporary philosopher Richard Taylor. In "Spatial and Temporal Analogies and the Concept of Identity," he states that "temporal and spatial relations, contrary to much traditional thought, are radically alike...Of course, I am not the first to press the analogies between space and time, but I believe they can be carried much farther than has been thought possible heretofore."<sup>2</sup> Taylor then proceeds, with a series of extremely clever arguments, to refute, one by one, most of the usual statements put forth as "obvious" distinctions between time and space.

Fortunately, it is not necessary, for our purposes, to argue for or against any particular absolute conception of time. This is because, as Bergson himself is at pains to show, film, in its very structure, is capable of establishing a conception of "time" all its own.

Actually, we can think in terms of three totally distinct types of "time" in relation to film. The first, "real time" or, if you prefer, "pure duration," is the extremely problematic "time" of "real life," which remains a mystery, a matter for philosophers. The second—we may call it "mechanical film time"—is always derived in the most simple and straightforward way from the space of the film strip as selectively parceled out by the shutter mechanism. Finally, there is "perceived film time," determined entirely by the nature of what is on the film strip and how it is perceived by the viewer.

It is important to understand that, while "real time" may or may not have an absolute meaning and "mechanical film time" has a simple empirical meaning, "perceived film time" is completely relative and must be defined, consciously or unconsciously, by the film maker and, of course, the viewer.

It seems clear that, in conventional film, great pains are taken to define "perceived film time" in terms of "real time." The former becomes a kind of double of the latter. The key to the success of this double is the synthesis of movement through an elaborate, totally systematic, process which controls the contents of the film strip in great detail. A strip of such film held in the hand is a series of similar looking photographs. Projected on the screen it is very different. The photographs "come alive" through the illusion of motion in "real time."

We can say, therefore, that conventional "motion picture" film actively defines the space of the film strip as fundamentally different from the synthesized time experience it produces. Pure film, on the other hand, containing no images, cannot possibly synthesize the illusion of motion in "real time." A strip of pure film, (flicker effects excluded, of course) whether held in the hand or projected on a screen, is, in either case, static. The "perceived time" of pure film, in fact, is directly related to "mechanical film time," and, like it, is derived from the space of the film strip. In other words, we may say that, in pure film, the space of the film strip is defined as directly analogous to the time experience it produces.

The above argument will serve as the basis for the following working principle: time, in pure film, can be treated as directly analogous to space; e. g. "events" can be treated like "forms," time proportions can be treated like space proportions, and, generally, formal concepts derived from the static visual arts can be directly applied to the treatment of events in "perceived time."

Such a formulation may seem unwarranted even to one who has had no difficulties up to now. Granting the efficacy of the technical arguments put forth to support the theory that pure film defines time as in some sense analogous to space, one could still object that it is not psychologically possible to actually perceive time, whether "perceived," "real" or "mechanical," in terms of space. Time seems to have characteristics of its own which have nothing to do with space.

At this point, I am afraid I cannot give a reply that I myself would consider to be completely satisfactory. Let me instead make the following isolated points:

1. By space, I, of course, mean one-dimensional space, the only actively articulated space of the film strip in pure film.
2. If the time of pure film cannot be understood in terms of one-dimensional space, I am not at all sure how it can be understood at all, nor do I have any notion of what I am doing when, as in Examples I and II, I plot such a film on graph paper.
3. Comparison to art forms using time, such as music, is not as helpful as it may seem, for music also employs "perceived time" structures which must also be established in the music itself and the culture. Conventional melodies, for example, "synthesize" smooth movement in a manner analogous to conventional film. Static music, such as that of John Cage or Morton Feldman, seems to define time in a radically different way. Spatial analogies, in fact, are often used in connection with their music.
4. A new approach to art often requires a perceptual leap of one kind or another. Pure film can offer a challenge to the viewer: can you perceive time as space—and if not, what, in fact, is being perceived?
5. Ironically, a strong argument in favor of our ability to perceive time spatially is provided by the very one who would argue most strongly against a theory which equated space with time. I refer to the writings of Bergson himself where page after page is devoted to the proposition that we normally do, in fact, perceive time in terms of space. Of course, Bergson's point is that we are wrong in so doing, because time, in some absolute sense, has nothing to do with space. I have already shown, however, that pure film need not define itself in terms of time in an absolute sense. Bergson's very subtle and penetrating arguments are, as a matter of fact, probably the strongest support possible in favor of the idea that time can be (albeit erroneously) perceived in terms of space, while there is really nothing in his philosophy that attacks the unification of time and space where this occurs simply as a definition for a particular, limited case.
6. An argument against my hypothesis can be made by calling upon the apparently crucial role of memory in distinguishing temporal from spatial experience. My answer is that the special role of memory in respect to time can be considered purely conventional and not intrinsic to our perception of time. What role, for example, can memory play in Example II(i)? It clearly exists in time when projected, but its existence on the screen is so brief that there can be no opportunity for memory to come into play. We will perceive certain events as occurring before and after others (if the film is in fact clearly articulated) but this is a simple matter of direct observation, as when we distinguish higher and lower in space. It would certainly seem inappropriate to say that, as we are observing run 7, we are also "remembering" runs 1-5. If memory can play no role in the perception of time relations articulated quickly, in what sense can its role be deemed essential over longer time periods? I am not attempting to show that memory plays no part in the experience of time, but simply that it is not necessary for such experience.
7. Consider the following sequence: 1. we begin with the notion of a design on a flat surface but, as this notion is vague, we decide to clarify it by imposing a progressive series of restrictions; 2. we impose a definite framed spatial limit; 3. we eliminate all referential imagery; 4. we eliminate all color except black and white; 5. we restrict all edges and lines so that they must be straight, not curved; 6. we eliminate all oblique lines or edges; 7. we eliminate all horizontal lines or edges; 8. at this point we pause—any further restriction would apparently result in an unarticulated surface—then we notice that our design still contains an element of vagueness since the viewer's eyes are free to roam unrestricted over the entire surface; 9. we create a device which restricts the viewer so that he can see only one part of the surface at a time; 10. we build an attachment to the device which forces the viewer to scan the surface in one direction only (say, left to right); 11. we add another attachment which further limits the viewer's freedom by forcing him to scan the surface at some constant speed (say, roughly, .6 feet per second).

Step number 7 is equivalent to limiting all articulation to a single dimension, so that the design becomes, in effect, one dimensional. Step 9 is equivalent to watching a film with an analytic projector which can go backwards and forwards, slow down and speed up or stop completely. Step 11 is equivalent to watching a film normally.

From this point of view, pure film can be regarded simply as the final step in a progressive restriction of our notion of an articulated surface and our mode of observing it. During the course of this restrictive process, something we usually think of in terms of "space" seems to have become something that we usually think of in terms of "time." But at what point, exactly, has the transition been made?

Let us consider step 9, as it is here that the word "time" is first used. One can imagine oneself looking at a mural on a long horizontal wall. One decides to restrict one's view somewhat, so one blocks out a small part of the right edge with the edge of a large sheet of paper. One moves the paper slightly. Is the mural now experienced in time rather than space? One continues the process, blocking out more and more of the mural at a time, always moving the paper more and more so as to scan the complete surface. At what point exactly, does the experience stop existing in space and begin existing in time? And is step 10 so radically different from step 9 as to constitute a completely different mode of experience?

It would seem logical to conclude that, regardless of the relation of space to time in any absolute sense, film (not only pure film) can be regarded as a special, highly restricted mode of spatial experience, which incidentally, is exactly the way it is viewed by Bergson. Pure film, moreover, can then be regarded as a further step in the process of simplification and clarification of our experience of space which, of course, forms one of the major evolutionary trends of Twentieth Century art.

If one can accept the above arguments, one ought to be able to accept our working principle. We can then, in fact, regard time as directly analogous to space for purposes of pure film and we can, at last, acknowledge Example II(1) as our prototype film.

Once this Rubicon is crossed, some provocative analogies come into view. Very small forms are generally considered to be more vividly perceptible, all else being equal, than very large ones, which tend to be perceptually unstable. Are very brief events similarly easier to perceive than very long ones? This seems to go counter to common sense, but might there not be something in it? Isn't a quick sharp glance more likely to produce a vivid impression than a long, thorough examination? Doesn't this have something, perhaps, to do with the hair-trigger alertness of the photographer? A long exposure of a photographed event will result in a blur. Doesn't the very brevity of our prototype film give it a sharpness and vividness that a longer film could not have?

Most conventional films are cumulative in their treatment of time--everything that happens later must be understood in the light of everything that happens earlier--all events accumulate so that the film is end-heavy, the ending being the most important part. If a painting could be experienced in this way, we might say that everything to the right could only be understood in the light of everything on the left; the right edge would be the most important part. Can we make a film that is more like an actual painting, where each event can hold its own, relating equally to all other events regardless of whether they are earlier or later?

Other analogies present themselves. One of the major themes of modern art has been the shift from the systematic, "universal," illusory "deep space" of the perspective grid to the existential, contingent, "real," "flat space" of the picture plane. Doesn't conventional film present us with effects in time that are directly analogous to the old perspective space? To give a crude example, we can equate chiaroscuro (modelling with shadow to give the effect of spatial depth) with fade ins and fade outs (modelling with shadow to give the effect of time depth). Less obviously, time elisions, created in a conventional film through montage, routinely bring events that must be interpreted as distant from one another in time into direct juxtaposition on the film strip, just as spatial elisions, created in a conventional painting through overlapping of planes, routinely bring forms that must be interpreted as distant from one another in space into direct juxtaposition on the picture plane. Thus, a direct cut from a shot of a woman leaving her apartment to a shot of the same woman arriving at her office, with the obvious implication that the necessary time has elapsed, may be compared with a direct juxtaposition of the contour of a man's head with the contour of a distant mountain, in a conventional painting, with the existence of the necessary spatial depth that must separate them also implied.

If film is capable of producing such effects of "depth" in time, might a usage more in line with the "flat space" of modern art also be available to the treatment of time in film? Can we speak of an existential, contingent, "real," "flat time" of the film strip? Modern painting, as a corollary to its treatment of space, has tended to value the kind of balance where all parts of the surface are of equal or nearly equal importance. Through its special approach to space, and through this principle of uniformity of surface, a kind of "surface tension," what Hans Hoffmann called "push-pull," is generated in much modern painting. Can we envision a type of film in which time could be conceived as a balanced or tensed "surface" in the same sense?

In a remarkable essay, Mondrian has written as follows:

In my early pictures, space was still a background. I began to determine forms: verticals and horizontals became rectangles. They still appeared as detached forms

against a background. ...Feeling the lack of unity I brought the rectangles together. ...Uniting the rectangles was equivalent to continuing the verticals and horizontals of the former period over the entire composition. ...Later, in order to abolish the manifestation of planes as rectangles, I reduced my colour, and accentuated the limiting lines, crossing the one over the other. Thus the planes were not only cut and abolished, but their relations became more active. ...Here again I tested the value of the destroying of particularities of form, thus opening the way to a more universal construction.

In place of representation of objects, pure geometric forms are created. These forms stand out against a background of empty space. In order to unify the totality of the canvas, the rectangles are brought together in a kind of grid. In order to further neutralize the effect of the rectangular planes as forms, only a few are filled in with color, and the lines forming the rectangles are emphasized at the expense of the planes. The planes, that is the forms are thus abolished. What, then remains? We must return to Mondrian's first sentence for an answer: "In my early pictures, space was still a background."

Looking at a mature Mondrian superficially, one sees lines. Looking more carefully one also sees the rectangles created by these lines. As one studies these paintings one becomes aware that there is a remarkable balance between the lines and rectangles, so that neither dominates the other. There is no background—everything is foreground. One is aware of neither lines nor forms but only of space itself, and a remarkable tension within this space.

Space itself! But everyone knows that space is an abstraction, a nothing. Yet Mondrian was able to actually establish space, and, in so doing, make the abstract concrete.

Can time, the other great "nothing," be established as well? Might it be possible to move from incidents (analogous to objects) to events (analogous to forms) to time itself (analogous to space) through a similar process of reduction and refinement? In Example II(i), for instance, the white runs constitute events (perceived as rapid flashes of light) while the black runs (perceived only as intervals between the flashes) function as a passive ground. This is analogous to the stage in Mondrian's work where the rectangles still appeared as detached forms against a background. In Part I of this essay, I have already discussed the relation of white to black in film, noting that, all else being equal, as in painting, white will "come forward" while black will "recede." Yet, as in painting, it is always possible to structure things in such a way as to neutralize this effect. If, through careful organization, one could construct a film in which both white and black runs would be equally active, so there would be no "background" at all, would this not be equivalent to the abolishment of the rectangular planes and the active establishment of space itself in Mondrian?

The above meditation on some of the implications stemming from our adoption of a direct analogy between space and time as a working principle, is intended, for now, only as a stimulant to the imagination. The possibilities involved take us far beyond the logical development of our design up to now.

Let us return, therefore, to our prototype—Example II(i). It is, of course, only one example of many such tiny structures which could be produced through a process similar to the one already outlined. To me, at least, the creation of structures of this kind can be a meaningful activity in itself. In terms of the overall scope of our theory, however, it can only be a beginning. Our search for a prototype has heretofore served to clarify our thinking about certain fundamental aspects of film structure. The prototype itself, now that we have it, must, in turn, serve as a basis for further development.

The balance of this paper (i.e., Part II of the theory as a whole) will be concerned, therefore, with the possibilities for growth from the tiny "kernel" already produced. Some of these possibilities are fairly easy to grasp while others are more subtle. I have chosen to continue at this point with a somewhat protracted discussion of one of the latter because it seems to follow very naturally from the situation in which we now find ourselves and because it leads to a train of thought through which certain basic principles can best be exposed. I hope the reader will not grow too impatient if everything is not made immediately clear, if certain obvious trains of thought seem to be neglected, and if certain decisions seem arbitrary. The matter should clarify itself as the discussion proceeds.

So far we have considered our prototype purely in the abstract—all of our thought has been devoted to a symbolic representation, a "notation" of it in graphic form. This is inadequate: first, and obviously, because we are creating film, not graphics; second, because our structure, in graphic form, lacks the powerful direct contrasts of light and dark that it needs to make itself felt as a real presence; third, because, while I have argued that time can be regarded as analogous to space for our purposes, there is no question that an experience of time is very different from an experience of space and only on film can we actually experience our structures in time.

We certainly want to be able to actually make a film from our notation and also to project it. Making the film presents only technical problems, though the difficulty of actually getting a print with both clear "whites" and reasonably opaque "blacks" should not be underestimated. Projecting the film, on the other hand, presents an awkward problem: how do you pass a film of only 24 frames through a projector?

This may, at first, seem to be a rather trivial difficulty. One could simply attach a loosely determined stretch of leader to both head and tail so the total length of leader and film will permit normal threading and projection. This solution is unsatisfactory, however, for the following reason: without introducing a purely arbitrary convention, there is no way we can establish the head and tail leader as extrinsic to the film itself.

The leader will, in fact, be perceived as part of the film. If its length is left arbitrary, the film itself will contain arbitrary elements, i.e., its structure will be weakened.

We come, therefore, inevitably, to a fundamental problem of meaning. Does a given stretch of film signify that it is in fact part of the work per se, or does it signify that it is not part of the work? This is directly related to the problem of the frame in painting. In film, we may call it the "time-frame" (not to be confused with the frame of the film strip).

The usual solution to the problem of the frame in both painting and film is to use some standardized material that is conventionally understood to function as something that, while not the work itself, serves to set the work apart from the world around it. The "titles" of a film, despite their secondary meaning of providing information, really function in this way. We understand, through what is essentially a social convention, that the titles are not "the film itself" but only a "time-frame" to prepare us for the beginning and to inform us of the exact moment when the film "is over."

Suppose that we decide, therefore, to use titles as the time-frame for our 24 frame prototype film. It is clear that the titles, in order to be legible at all, must last an amount of time so long, in relation to the film itself, as to give the impression that the film is only a part of its own titles.

We could, of course, insert some leader in between the titles and the film, but then, again, it would not be clear that this leader is not part of the film. Since we cannot ignore the fact that any leader coming after the titles, no matter how neutral, will tend to be seen as part of the film itself, we have no choice but to make the leader part of the film. This can only be done by actively determining its exact length, rather than giving it some arbitrary length.

The prototype film begins and ends with white, therefore we can add runs of black at both head and tail to which titles can be attached. How long should these runs be? If they are to serve their function as a kind of neutral zone between the titles and the "kernel" of activity that was originally our prototype film, it would seem they must be substantially longer than 24 frames. But how long exactly?

We must remember at this point that our purpose in setting about making a prototype film of only 24 frames was to ensure that the problem of relating part (any single frame) to whole (the entire film) would be solvable directly, without the need for systematic procedures. Within the easily workable "space" of 24 frames, it is not very difficult to determine the exact number of frames in any run through a kind of intuitional logic, as has been shown in our discussion of Example II. We could probably increase the number of frames to 30 or even 36 and still maintain the same intuitional give and take between part and whole. As we expand much farther, however, it soon becomes impossible to maintain a directly controllable balance of part and whole--the number of parts (frames) simply becomes too great.

Since we can longer work exclusively through direct spatial intuition, we must ask ourselves if any viable procedure is available. There is a procedure, of course, that has been right under our noses. We have spoken of space and time in relation to film, but we have neglected something which is perhaps just as basic--number.

Film, unlike painting or music, is, in its very essence, modular, the "module," or indivisible basic unit, being the frame itself. Each frame of a film can be given a number and structural questions in film can therefore be dealt with in numerical terms. Or can they? Numbers, as is well known, have all kinds of structural relations of their own. In what sense do these mathematical structures relate to the structures of things other than mathematics that happen to be denumerable? A great many questionable systematic procedures in the arts and elsewhere have their origin in a failure to seriously and honestly consider the above question.

While the use of number carries with it the danger of arbitrary systemizing, it is also, potentially, a powerful means of extending intuitional thought beyond the limits of the directly perceivable. This is clear when we consider simple proportions. The numbers 2/1, 200/100, 2000/1000, while vastly different in scale (let us say they denote length in yards), stand for exactly the same relationship: the numerator is twice

as large as the denominator. If the lengths of, say 2 yards and 1 yard respectively, look right together on a small scale model, we intuitively feel that they will look right together when the scale is vastly expanded to 2000 and 1000 yards for the finished product, because we know that the ratio will be the same. This is not to say that differences of scale are not important. They are extremely important, but they do not usually seem to affect our perception of relationships. If they did, than a building seen from a distance, where it would appear small, would seem to change as we came closer and its image increased in scale on our retina.<sup>4</sup> By using numbers to create or clarify proportional relationships, therefore, we can greatly extend our powers of visualization.

Let us consider a possible solution to the problem of our new, longer, film through the use of numbers:  
Example III(a)

White:	(titles)	2	2	1	6	1	(titles)
Black:		100	1	1	3	7	576

The film as a whole can be broken down into the proportion 1:6, if the first run of 100 frames is compared with the remainder of the film (576 plus 24 equals 600). This proportion is echoed in reverse by the last two white runs: 6 and 1. The "kernel" section (our original prototype) taken as a whole is related to the last black run of 576 in a proportion of 1:24, which is the same as the relation of any single frame to the "kernel" itself.

How are we to go about making an evaluation of this film? Leaving a discussion of the "mathematics" aside for the time being, we could say that two of the parts, the first and last runs, are so much longer than the other parts, the runs of the "kernel" section, as to completely overbalance them, thus spoiling the relation of part to part. By the same token we could also say that the parts of the "kernel" section are so short in comparison with the length of the whole that they cannot relate to it at all, thus spoiling the relation of part to whole.

One would have to object to these criticisms, however, by pointing out that parts of the "kernel" section cannot justly be compared to the other parts on a one to one basis, since they clearly come together to form a subsection, the "kernel" itself. These smaller parts should not be considered parts of the whole, but parts of the subsection to which they belong—this subsection, in turn, can, as a unit, be regarded as a part of the whole. One would thus have to renotate the film:

White:	24	2	2	1	6	1	}	576
Black:	100	{	1	1	3	7	}	

We are, of course, talking about a hierarchical structure, a structure involving two or more levels. The grossest level can be called "the level of the whole," the next level can be called "the first sublevel" and so on, until we reach "the level of the smallest part." From the above revised notation, it is clear that the film, on the level of the whole, consists of three parts, of 100, 24, and 576 frames, respectively. The second part is subdivided into 9 parts on the first sublevel (which is also, in this case, the level of the smallest part), consisting of 2, 1, 2, 1, 1, 3, 6, 7, and 1 frames respectively. Note that parts on the first sublevel are enclosed in brackets—parts on the second sublevel would be enclosed in double brackets and so on. Note also that the number 24 does not stand for a run but a section. It is clear that a structure like this must be analyzed on each of its hierarchical levels. The level of the smallest part (the first sublevel, in this case), has already been fully evaluated in our analysis of Example II. The level of the whole breaks down into three parts, of 100, 24, and 576 frames, respectively. In general terms, it is not difficult to see that each of these parts is clearly differentiated from the others, first, because no two numbers are similar, second, because the second part is subdivided while those surrounding it are not. Moreover, the second part is not placed vaguely in the middle somewhere, but is clearly nearer to the beginning than the end.

Of course, the most problematic aspect of Example III lies not with its general, but with its specific properties. We have been forced to introduce numbers in place of direct spatial intuition because of a drastic increase in scale. This is comparable to a situation faced by a mural painter or an architect, where the scale of his work is so great that he cannot see everything at once. A scale model will help plan the larger units, but will be inadequate if he wishes to include the smallest units as well in his overall plan. In order to relate the smallest to the largest units, rationally, he must use numbers. We must, of course, be careful to distinguish purely numerical properties from perceptually meaningful ones. If the numbers for Example III were changed from 100, 24, and 576 to 99, 24, and 577, this would result, in purely numerical terms, in a far more complex, far less rational, set of relationships. Yet there is no question that the perceived proportions would not be affected in any meaningful way. One could pedantically insist that this fact invalidates the entire numerical structure, but this would be to place an undue emphasis on numerology. After all, the complex, irreducible ratio, 24:577 is extremely close to the much simpler, reducible ratio, 24:576—both resemble 1:24, one perfectly, the other imperfectly. If we deny this, we might as well deny  $\pi$ , a simple ratio which can only be approximated numerically.

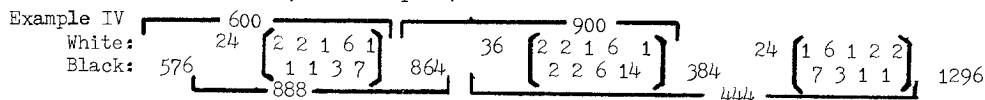
There is a difficulty in this regard which may already have entered the reader's mind: does "clarity" imply that everything must be made clear? If so, then we can expect the viewer of Example III (presented as a projected film) to be able to reproduce its score, or at least, to be able to say, "ah, yes, the first black section is  $1/6$  the length of the other two sections." This is, of course, highly unlikely. One could object that there is no point in arranging a film in terms of certain proportions if the viewer will not be able to recognize them. This kind of objection seems to be at the heart of the extreme difficulty people find in understanding the motivations of artists who create through rational means, especially where numbers are involved.

The use of numbers and proportions arising from numbers in pure film is intended only to facilitate the creation of structures which are so organized that they (the structures, not the numbers) may be clearly perceived. Such numbers and proportions are not intended to communicate themselves, nor is the viewer expected to understand how such numbers relate to what he sees. This situation can be compared to a modulation (change of key) in a piece of music. From the point of view of theory, a modulation involves two different keys, the interval between them, the use of a "pivot chord," etc. In order to understand a modulation, one must be fully aware of all this. To the listener, however, all that is important is that what he hears is coherent to him on a perceptual level—he need not be aware of the exact interval between the old and the new key, nor will he even have to be aware that a modulation is taking place. A good modulation is simply one that is coherent and does not result in unintentional perceptual confusion—of course, someone who was tone deaf might well fail to perceive the coherence and might then insist that unless he could be made to understand exactly what was going on simply from listening, the composer was bluffing.

We should not, of course, carry the musical analogy too far. It would be more accurate to say that the proportions of Example III are there to help create a certain kind of balanced time awareness analogous to the awareness of spatial balance sought by painters, sculptors and architects. For example, the length of the last run, 576 frames, is in the same relation to the kernel section (24 frames) as that section is to its smallest member—a single frame. When we actually watch this film for the first time, this relationship will probably not occur to us—the last run will seem much longer in relation to the kernel section than it actually is. This is a natural result of our lack of awareness of proportions within the very brief duration of the kernel section itself—both this section and its smallest details will, at first viewing, tend to be perceived as, simply, very short. With repeated viewings, however, as awareness increases, the true balance of the relationship should make itself felt more and more.

It is true that there is little in the structure of Example III to facilitate the development of the awareness we are talking about. This is due not so much to the proportions per se as to the problem of lack of richness on the level of the whole. The paucity of higher level events tends to make the longer runs seem vague—there is little to compare them with and as a result they will tend to be perceived, without precision, as generally "long," "very long," or "short." If there were more events, there would be more relationships, and the perception of each event would be more finely tuned.

There would seem, therefore, to be a need for further expansion. This leads to the consideration of another, more complex, structure:



In Example IV, the second, fourth, and sixth parts on the level of the whole, of 24, 36 and 24 frames respectively, are subdivided to form sublevels. The first such group is our original prototype, the second a variant in which all the black frames have been multiplied by two, the third the original in reverse order. We shall leave aside a discussion of the rational basis for such variation for the time being, in order to concentrate on the large scale structure.

We see that, in addition to the presence of two long runs of black at the beginning and end, as in Example III, there are two additional such runs in the middle. These runs have the function of reinforcing the role of the outer runs as real structural entities rather than simply "buffer" zones, as in Example III, between the "kernel" section and the titles. Moreover, the presence of four long runs instead of two aids in the clarification of the overall large scale proportions by providing more bases for comparison. Each number is sufficiently differentiated from all the others so that there should be little difficulty in perceiving relative lengths.

Some important numerical relationships that may not be immediately apparent are clarified in the above "score" through use of horizontal brackets showing the sums of certain contiguous groups and/or runs.

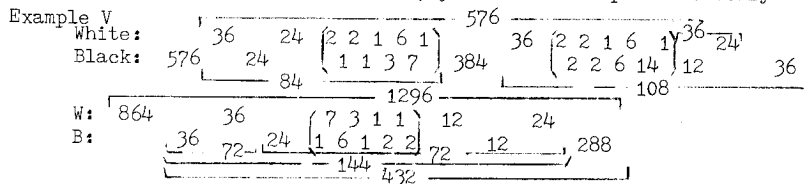


The following breakdown further clarifies the proportional relationships:  $24:36=2:3$ ;  $576:864=2:3$ ;  $384:576=2:3$ ;  $864:1296=2:3$ ;  $600:900=2:3$ ;  $888:444=2:1$ ;  $24^2=576$ ;  $36^2=1296$ ;  $24 \times 36=864$ .

While no viewer could possibly infer the existence of such relationships simply by watching the film, it does seem reasonable to assume that the saturation of proportions in the simple relation of 2 to 3 will create a certain amount of clarity, unity and balance. Similarly, the division of the inner sections into two groups with the proportion 2:1, should also be a clarifying factor. The structural function of such proportions would be easier to accept, of course, if they were being applied to the design of a mural, or a work of architecture. We are used to thinking in terms of rational spatial proportions. Whether or not one can accept the meaningful presence of such proportions in time will depend, I suppose, on the degree to which one can accept our "working principle" that the time of pure film is directly analogous to its space.

There are, however, real problems with the design of Example IV that make the numerical structure less effective than it might be. The fact that all the unsubdivided runs are black tends to make them relatively passive, as if they were merely intervals between the short, subdivided sections. More important, there is a discrepancy between the length of the unsubdivided runs (384 frames or more) and that of the subdivided sections (36 frames or less), which makes the latter seem lost in the midst of the former. Because the smaller sections are so remote in size from the larger ones neither group is capable of clarifying or reinforcing the proportions of the other.

In view of the above drawbacks, yet another step is necessary:



Most of the numerical relationships of Example IV are incorporated into Example V, which is in fact simply a more elaborate (and also more compact) variation of IV. There are also some important new relationships:  $72:108=2:3$ ;  $864:432=2:1$ ;  $288:144=2:1$ ;  $144:72=2:1$ ;  $24:24=36:36=72:72=576:576=1:1$ .

The single long white run of 864 frames should sufficiently balance the three long black runs. The discrepancy in length between the long runs and the much shorter subdivided sections is mitigated by the creation of unsubdivided runs of 12, 24, or 36 frames which surround the subdivided sections. These runs reinforce the structural function of the subdivided sections by providing simply related proportions for comparison. At the same time, they help to create groups of intermediate length (48, 84, 72, 108) which relate the largest and smallest elements to one another.

In addition to the large number of 2:3 relationships inherited from Example IV, there are also new relationships of 2:1 and, even more important, 1:1. The last especially serve as significant clarifiers of the structure.

While all these numerical proportions seem very complex, the complexity stems from the fact that they are nested within one another to form a tight, mutually reinforcing nexus of relationships. Such a nexus can determine intuitively perceptible relationships of great simplicity and clarity, as, in my opinion, will be evident from careful study of Example V.

Example V is the end result of a logical process of expansion. I have discussed this process in some detail because the element of necessity involved in every decision, step by step, is, to me, extremely instructive and revealing. One such step, however, the introduction of hierarchical structure, may well be premature in the context of our general enquiry. While the construction of a hierarchy was necessary in relation to the particular type of expansion made necessary in turn by the need for titles, there are, in fact, simpler non-hierarchical means of expansion which it is important for us to examine.

Let us return to a consideration of our prototype in the original 24-frame form. Was it really necessary to add titles, to create a time-frame? Is there any way to project such a film without resorting to this cumbersome procedure? The first painter to do without the frame was, in fact, Mondrian. His solution was to mount the canvas on top of a wooden framework, so that it jutted forward from the framework—the edges of the canvas become visible and in fact become part of the work itself. The result is that the physical reality of the canvas as an object is greatly emphasized—it becomes a cross between a painting and a relief.

If we let ourselves recognize that film, too, is not simply an immaterial "medium" for symbolic "communication," but also has a physical reality, it becomes easier to see

how we might project our prototype without a need for titles. Holding the film in our hands, we see that the real problem lies simply in finding a way to thread it on to the projector so that, when the projector is turned on, only that piece of film itself and nothing else will pass through the gate.

We can put an arbitrary length of numbered academy leader at the head of our film. That leader will be used simply for threading. The projectionist will adjust the film so that the first frame of the film itself (the first frame after the last number of the academy leader) will be the first frame projected when the projector is turned on. There will be no tail leader at all. After the film is shown, it will simply run out of the projector. All the viewer sees is the film. In this way, a 24 frame film or a film of any length can be shown as a pure and complete structure without the need for conventional symbols of any kind.

Having found a way to project our prototype without the need of adding anything to it, we have only now, for the first time, really achieved our original goal, a true 24-frame film. Only now are we in a position to consider types of expansion from this prototype that are simpler and more basic than those leading to Examples III, IV, and V.

Probably the simplest, most fundamental and most powerful type of structural expansion is through uniform increase of scale. In pure film this would simply be a matter of multiplying every run by the same number. The original proportions would of course be unaltered. Would such an expansion of our prototype leave us with a film as clear and meaningful as the original?

Increase of scale does seem to be a basic and significant form of expansion. We shall return to it. But there is something definitely wrong when we apply it so simply and crudely to our finely tuned prototype. One problem is that the single frame ceases to be the basic unit and, as a result, a principle of economy is violated. Also, as scale increases, one loses detail. A good analogy would be to a grainy photograph. The proportions would be identical, but a sense of vividness would be lost.

Suppose that, instead of multiplying every run of the prototype by the same number, we multiplied every run by itself—thus:

Exemplè VI

$$\begin{array}{l} \text{White: } 2^2 \quad 2^2 \quad 1^2 \quad 6^2 \quad 1^2 \\ \text{Black: } 1^2 \quad 1^2 \quad 3^2 \quad 7^2 \end{array} = \begin{array}{l} 4 \quad 4 \quad 1 \quad 36 \quad 1 \\ 1 \quad 1 \quad 9 \quad 49 \end{array}$$

By squaring each run we have created a longer film directly from our prototype, yet without the total loss of "fine grain" detail. We have, in a sense, "dramatized" our film, forcing it to extremes by eliminating any possibility of certain intermediate numbers occurring. The difficulty here is that the proportions are changed and their relation to the original, carefully calculated, proportions, while perfectly clear arithmetically, is not at all clear perceptually. The relative size of each run in relation to every other run is preserved, but the differences will always be exaggerated in such a way as to considerably distort the original relationship.

Expansion by adding the same number to each run creates, interestingly enough, the opposite effect. Relative size is preserved, but differences tend to be minimized—the larger the number used the more all relationships will tend to be perceived as similar. And, of course, as with multiplication, there is a loss of detail.

We seem to be at an impasse. Before attempting any more numerical procedures, let us more fully consider the way in which any of these procedures is going to be perceived. If we define a structure in terms of the relation of part to whole, it is clear that each part, in order to be perceived as a distinct part, must be distinguished from the parts next to it in some way. It must be "articulated." In many cases, articulation is achieved through specialized procedures designed for that purpose only. In painting, the use of contour lines is a good example of pure articulation. In music, articulation often means a certain way of separating notes by means of a specific technique developed for that purpose only—various kinds of bowing or tonguing.

Reducing all our materials to the barest minimum in order to achieve pure film, we have not been able to "afford" purely articulative elements. This has not been a serious drawback, however, since our materials themselves (black and white frames) are mutually articulative. Each white run is articulated by the black runs coming before and after it and vice versa. This fact is crucial to the way in which such a film will be perceived and creates very special problems. There is a very good reason why most structures use special devices whose sole function is articulation. Articulators tend to be invisible. Since their function is to set off elements which are more important than they are, it would apparently be defeating their purpose if they called too much attention to themselves. Thus a contour in a conventional representational painting serves to make a form more visible—the contour itself is not intended to be seen. The forms of a structure are in the foreground, the articulators in the background. Much of the problem of "depth" in painting can be understood in this sense, as a relation between forms and articulators. Of course, modern painting, in which the surface becomes increasingly active, shows a progressive tendency to emphasize articulators such as contour to the point where, with Mondrian, there is a complete equality of mutually articulative forms.

Returning to the situation of pure film, and contemplating the relation between articulation and the problem of "figure-ground," it becomes apparent that the mutually articulative blacks and whites can be described as, in a sense, invisible to one another. Only in the rarest cases is it possible to perceive both figure and ground simultaneously. Think of the famous drawing of two faces in profile which can also be seen as a vase. This is a good, if crude, example of mutually articulative forms. When we see the vase the faces are invisible, when we see the faces the vase disappears—we cannot see both.

Normally, in pure film, as I have already made clear, the white runs will tend to be seen as "events" and the black runs will tend to be the invisible articulators. Under certain conditions this situation can be reversed and, hypothetically, under very special conditions, a true balance might be achieved. In Example II(i), the white runs are more easily seen as "figure" and the black runs "ground." The black runs are far from completely passive, however, since they are highly differentiated in length—totally passive articulators would all be the same length. This is analogous to the variation of the thickness of the black lines that one finds in Mondrian from 1925 on.

What this all boils down to in terms of the problem at hand is this: when dealing with proportional relationships between the mutually articulative elements of pure film, one must understand that two independent sets of proportions are involved—one for each element. This "principle of articulative independence" can profoundly affect our approach to structure. Thus, for Example II(i), one set of proportions is that of the white runs: 2:2:1:6:1; the other, that of the black: 1:1:3:7. Of course, these proportions can never be completely independent, since each is necessary to set off the other. Yet it is apparently basic to the nature of human perception that it is extraordinarily difficult, if not impossible, to be actively aware of both at once—the mind of the viewer separates them.

This duality of proportional structure suggests another approach to expansion. The two sets can be treated independently. One can be multiplied while the other remains the same. Let us multiply, for example, all the black runs of our prototype by three, while leaving the white runs alone:

Example VII

White: 2 2 1 6 1  
Black: 3 3 9 21

Perceptually speaking, one will see the same sequence of white runs as in Ex. II(i), but the articulation of these runs will be on a larger scale (though, of course, proportionally no different than before). The effect is, of course, somewhat different, but no apparent structural damage has been done. In terms of the criteria raised in the discussion of Example II, Example VII would seem to be as viable as Example II(i). Additionally, the frame still remains as the basic unit—any loss of vividness is confined to the black runs only.

Now let us multiply the white runs by three, leaving the black runs intact, and see what happens:

Example VIII

White: 6 6 3 18 3  
Black: 1 1 3 7

The effect will be radically different from that of either II(i) or VII. Note how, in Ex. VII, the black runs, already passive, are made even more so by the increase in scale. In Example VIII, it is the white runs which, through their increase in scale, become passive. The laws of gestalt psychology are at work here—figure-ground relations are determined to some extent by relative color and brightness, but also by purely structural factors. The smaller or thinner a form, the more it will tend to be perceived as foreground, especially when it is placed against significantly larger or thicker forms. For the first time, the now relatively "thin" black runs will be perceived as forms rather than articulators. The white runs will still come forward as well, because of their brightness, so that Example VIII is better balanced than II(i) or VII.

Examples VII and VIII are both non-hierarchical expansion-variations of II(i). One could, in a similar way, create additional versions by multiplying one set of runs or the other by various numbers, but there would be limits. If the multiplier became too large, one set would simply become lost in the other. Examples VII and VIII double the length of II(i) to two seconds. One could conceivably expand the prototype to 10 or 15 seconds, but even at that point the results would begin to look pretty thin. There would seem to be a serious limit in the degree to which non-hierarchical structures can be expanded.

Before completely abandoning the non-hierarchical approach, there is one other rather odd but effective modus operandi worth mentioning. Abandoning our graphs and numbers, we could stretch a strip of 50 feet or so of film out like so much clothes line. By pacing back and forth along this space as though it were the space of a wall mural, we could get an intuitive grasp of the whole in an almost completely physical sense. Notations would be made directly on the film itself. Structural decisions would be similar to those leading to the creation of the prototype, but on a much larger scale, more crudely made, and more obviously based on purely spatial relationships. I myself have

made films in this way and find the technique extremely interesting and satisfactory.

In order to work in this way, however, one cannot maintain an awareness of the frame as basic unit and must consequently sacrifice one of the most fundamental properties of film—precision. Part can be related to whole in a general intuitive sense—much as an abstract painter, say Barnett Newman, might work—but one's concept of both whole and parts will remain more or less vague. One will certainly not be making the most efficient use of the material at hand.

The delicate relation of part to whole can be preserved, in an intuitively viable, efficient, structurally precise manner, with great freedom and scope, if we accept the use of heirarchical structure, as we have already learned from Example V. This film, however, was the logical end product of an expansion of a very special and limited kind. Three variations of the prototype, of 24, 36 and 24 frames, respectively, were nested among solid, unsubdivided runs of equal or proportionally related length, forming subareas which, in turn, were nested among longer solid runs, proportionally related to the subareas. All events, both large and small, were united through the pervasive presence of the ratio 2:3, which can be said to saturate the numerical relationships.

Following the development of this structure, from its beginnings with Example II(i), through its expansion in Examples III, IV and V, we can see that it was formed by a process of accretion. Materials of a different sort from the original prototype were progressively added in order to place the "kernel" sections in a contextually appropriate "setting."

This kind of expansion-by-accretion is quite different from the types of expansion we have just been considering. Examples VI, VII, and VIII were formed by an expansion of II(i) from within. Everything in the new versions was directly derived from the original, which, in this context, can indeed more accurately be called a "kernel."

Expansion from within, a kind of flowering, holds out a promise of harmonious unity which, in the examples we have so far considered, could not be realized. These examples, being non-heirarchical, are too limited in scope. Expanded beyond a certain point, their clarity turns into matter-of-factness—they become empty. Expansion by accretion can lead to a true richness, but whatever unity exists must be achieved through a tricky process of trial and error, which, carried beyond a certain point, becomes all but impossible. The delicate give and take between intuition and arithmetic which led to the composition of Example V might well become hopelessly pedantic numerology if one attempted to expand it much beyond its present length while trying to maintain the 2:3 ratio as a unifying factor.

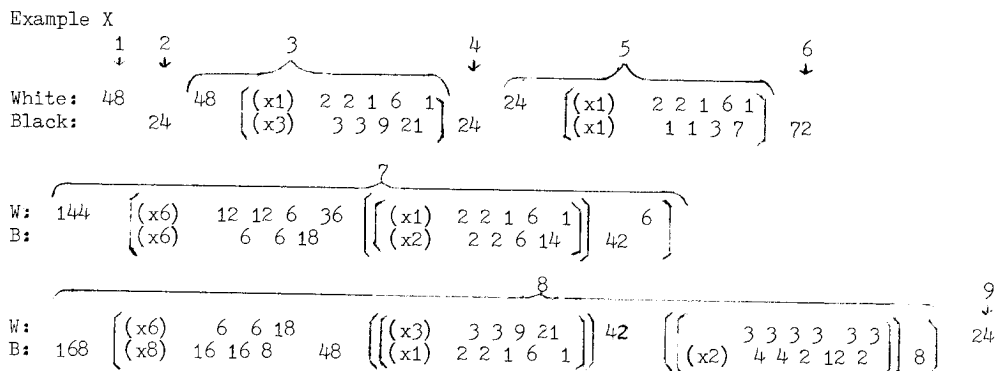
Each method having its strengths and weaknesses, some way of combining the best aspects of both would certainly be desirable. Let us return to the first type of expansion from within that we considered: uniform increase of scale. Each run of the prototype was multiplied by the same number. This method was rejected because it led to loss of detail. Disregarding this for the time being, let us create a version of our prototype by multiplying all runs by 24:

Example IX

White:	48	48	24	144	24
Black:	24	24	72	168	

Now, instead of regarding this as complete in itself, let us consider it as outlining the "level of the whole" of a hierarchical structure. As in Example V, more detailed subunits can be "nested" within the larger superstructure.

If these subunits could also contain variants of the prototype, this would greatly enhance the possibility of a clear, unified structure. At every level the film would be pervaded by the same design. Since each run of Example IX is a multiple of 24, each could indeed contain a simple multiple of the prototype. But this solution would be overly simple and monotonous, even banal. Much more promising are the possibilities opened up by employment of the "principle of articulative independence," the only approach which permitted a satisfactory non-hierarchical expansion of the prototype (see Examples VII and VIII). For reasons given earlier, the runs of one color can be regarded as independent from those of the opposite color articulating them. Each set of proportions can thus be expanded by a different multiple, greatly increasing the possibilities for variation while tending to preserve the clarity of the original design.



Example X gives a somewhat tentative idea of how such a nested hierarchical structure based on expansion from within might work. Each section on the level of the whole is numbered so the relation with Example IX can be more easily seen. Parts on the first sublevel are enclosed in brackets—there is also a second sublevel, enclosed in double brackets.

The first two "events" of Example X, a run of 48 white frames followed by a run of 24 black frames, are just as they were in Ex. IX. The 48 frames of section 3 are subdivided. Each subdivision is preceded by numbers in parenthesis, each number being that by which the following line of white or black runs from the prototype has been multiplied. Note that, as in Examples VII and VIII, the white and black runs are treated independently. Thus, in section 3, the original set of white runs is retained (i.e., multiplied by 1) while the black runs are multiplied by 3. Since each set originally contained 12 frames, this gives us a total of 48 frames ( $1 \times 12 = 12$ ;  $3 \times 12 = 36$ ;  $36 + 12 = 48$ ).

Section 4 is a simple run of 24 frames. Section 5, also 24 frames long, contains the prototype in its original form. Section 6 is a single run of 72 black frames, but section 7 is subdivided twice. The first subdivision, on the first sublevel, consists of the prototype multiplied uniformly (both white and black) by 6. The seventh run of this subdivision, what would otherwise be a run of 36 frames of white, is further subdivided to produce a second sublevel. This is indicated by double brackets. Section 8 is also complexly subdivided. Note that, since this section was originally a run of black, any subdivision must, to fit the scheme, begin and end with black. The prototype must therefore, be inverted, so that what was originally white becomes black and visa versa. In this case the white runs of the prototype are multiplied by 8 and changed to black; the black runs are multiplied by 6 and changed to white. The seventh and eighth runs of section 8 are each subdivided again. Note that in the second such subdivision, the white runs are of uniform length, thus unrelated to the prototype—the black runs conform to the prototype doubled and inverted. There seems to be no reason why one set of proportions may not, from time to time, be completely separated from its mate and articulated uniformly.

Now let us take another, more analytical, look at the structure of Example X. Notice first of all that no two subdivisions are exactly alike. Nevertheless, there are elements which are not varied. The white set of runs—from the prototype in its original form (2,2,1,6,1) occurs unaltered four times, the first three as white runs, the last time as black. In fact, the last appearance is the exact inversion of the first. The articulating sets of the second and third appearances are different from one another and from that of the first and fourth (different in scale, of course, not in proportion). The recurrence of this significant element in its original form adds another level of unity to the total structure. The fact that each recurrence is varied, either through variation of the scale of the articulating set or through color inversion, is also important. Totally unvaried recurrences would risk banality.

The exact recurrence of the set: 6,6,18,42 (the original set of black runs multiplied by 6) in both sections 7 and 8 (articulated differently each time) is less conspicuous because the second is an inversion of the first and also because both sections are subdivided in different ways.

The use of this type of exact recurrence poses an interesting dialogue between scale (as an absolute) and proportion (as relative) which echoes the dialogue between pitch (absolute) and interval (relative) in music. We shall have more to say on this in future.

The very last subdivision of the structure is unique and deserves discussion. Six white runs of three frames each are articulated by five black runs derived from the white runs of the prototype. This sudden departure from the norm seems to make an effective ending while, at the same time suggesting new possibilities. Note that the number 42 is not divisible by 12, thus could not be subdivided in the ordinary way. The introduction of uniform runs as articulators to runs derived from a given set of proportions provides

our method with a good deal more scope. Another possibility, not used here, is the articulation of a given set by itself or some multiple thereof, rather than by its original companion set.

In evaluating Example X, it is important to understand that the viewer should not be expected to recognize the fact that all the proportions are derived from the same set. A set of proportions, in this context, is not comparable to a rhythmic or melodic motive in a piece of music but is closer to the proportions of architecture.

In order that the reader may better understand this, let us review some of the steps that led us to this point: 1. a 24-frame prototype film was composed with proportions designed to provide a clear experience of forms in a limited graphic space; 2. an hypothesis was put forward and argued that clear proportions in what amounts to a one dimensional space are equally clear when "realized" in time; 3. an hypothesis relating number, scale and proportion was also put forward—this implies that any change of a set of proportions which is only a change of scale will not change the perceptual meaning of those proportions—i.e., a set of proportions that results in perceptual clarity on one scale will continue to be clear on any other scale; 4. the proportions of the 24 frame prototype were expanded uniformly to cover a time span of 24 seconds—if we accept the hypotheses described in steps 2 and 3, the resulting structure should still be meaningfully clear; 5. it was recognized that the expanded structure, however clear it may be, lacked richness of detail; 6. in order to deal with the problem of richness, the expanded structure was subdivided through further use of the original set of proportions, at its original scale and in various modified forms, according to the "principle of articulative independence."

Although several steps have been omitted, the above provides what is essential for an evaluation of Example X. We can see that the basic idea is the maintenance of perceptual clarity at all levels of the structure; the key to this clarity is the use, at all levels, of variants of the original set, which should retain its clarity through transposition to any scale, as long as the original proportions within each color remain intact.

Any structure saturated at all levels with a single set of proportions will, of course, also achieve a good measure of unification. Such unification will make itself felt primarily through overall consistency, the absence of arbitrary features, and "architecturally" proportioned balances, rather than the recurrence, necessarily, of recognizable "thematic" events. Such events may be imposed, but they are not necessarily to be expected, or even desired, in such a structure.

Example X is not without faults. It is presented so that the reader may have an idea of how this type of structure can work. Certain interesting problems arise through the critical evaluation of this film, but it is not necessary to deal with them at this point.

It is obvious that Example X is only one of a great variety of ways in which Example IX might have been subdivided in terms of its own proportions. This in itself indicates that, though the "solution" presented here has systematic aspects, it is very far from being purely systematic. In fact, a great deal of the structure obviously was determined through intuition. At the same time, due to the special nature of our method, every intuitively derived decision was made in a context that limited the problem to the extent that intuition could function structurally and with precision. In order for our original prototype to be structured according to this objective functioning of intuition, it was necessary to simplify the problem in toto by making the prototype so radically brief that part and whole could be structurally related through intuition alone. Now we see how it is possible to expand almost indefinitely from such a prototype by using a method which permits the intuition to function objectively in settings of some complexity.

In a hierarchical approach generally, intuition will function in the relation of part not to whole, but to some sublevel, and in the relation of lower order sublevel to higher order sublevel. Ultimately, the highest sublevels can be intuitively related to the whole. In the special type of hierarchical structure illustrated here, there are additional possibilities for the establishment of precise, structurally significant intersectional relationships which can also be determined largely through intuition. The importance of such an approach will be clear when we recall the following statement from Part I of this essay:

To make a true structure, the artist must make all the decisions at every stage of the work's progress and on every level of its existence. And these decisions, unlike those made by the purely subjective artist, must be thought out, logical decisions, at least as rational as those of the system builder. Structure, unlike patterning, leaves nothing out; it is also intuitive, also inspired.

Those of my readers acquainted with music theory may recognize in the structure of Ex. X the influence of the "method of composing with twelve tones related only with one another," created by Arnold Schönberg. It was Schönberg (preceded, perhaps, by Joseph Hauer) who first proposed the creation of an entire piece of music from a single germinal series of tones, and then went on to compose a rich and varied body of music, of central importance to our time, conceived through his discovery.

The idea of extending Schönberg's method from the realm of tone to that of time is not new. The American composer Milton Babbitt may have been the first to do so. Also important were a group of Europeans: Messiaen, Boulez, Stockhausen, Goyvaerts, Pousseur, and others, inspired by aspects of the work of Schönberg's great disciple, Webern, extended the so-called "serial" approach to all the parameters of music, including rhythm and overall structure.

My role has been to adapt serialism to the requirements of pure film, and to demonstrate the promise of, and the existence of a certain necessity for, such an approach.

Example X, in fact, only begins to show the rich possibilities and powerful structural procedures inherent in the serial approach. In the next installment I intend to thoroughly explore its application to the development of pure film.

#### Notes

1. Victor A. Grauer, "A Theory of Pure Film—Part I," Field of Vision, Fall 1976, No. 1, p. 2.
2. J.J.C. Smart, ed., Problems of Space and Time. New York: Macmillan, 1945, p. 13.
3. Piet Mondrian, Plastic Art and Pure Plastic Art. New York: Wittenborn, 1945, p. 13.
4. The issue is not as fully resolved in my own mind as the necessarily simplified discussion in the text may suggest. Perhaps changes of scale, while not affecting actual proportions, might affect our perception of them. After all, proportions seen on a small scale model can be taken in at a glance while the same proportions greatly expanded are not easy to grasp as a whole. My tendency to, nevertheless, accept perceptual invariance of proportion through change of scale, at least provisionally, is reinforced by the following observation: small scale proportions (e.g., 2/1) are easy to grasp because the total number of elements ( $2+1=3$ ) is so small as to provide an easily perceived whole but they are also difficult to grasp because the difference between the parts is, in absolute terms, very small ( $2-1=1$ ); large scale proportions (e.g., 2000/1000) are difficult to grasp because the total number of elements (3000) is so large as to make it difficult to perceive the whole, but they are also easy to grasp because the difference between the parts is, in absolute terms, very large ( $2000-1000=1000$ ). This presents an interesting reciprocal relationship between proportion and scale which seems to preserve proportion as a perceptible constant at any scale.

## John Whitney and Jordan Belson: Beyond the Frame

By Steve Olswang

Despite apparent differences, the films of John Whitney and Jordan Belson contain many similarities and parallels. There is a cohesion present between them that defines their films on many levels. There are affinities between these films that exist nowhere else either in "experimental" or "conventional" filmmaking.

This trend can be traced back to the Art in Cinema Series held in San Francisco in 1947. The Whitneys (John and his brother James) showed the Five Abstract Film Exercises there, which were their first major works. Among those in attendance was Jordan Belson, then a painter. Belson was also fascinated by the films of Oskar Fischinger and Hans Richter.

The series also gave the Whitneys an opportunity to issue a statement on their work. They described it as a continual struggle of maintaining equilibrium between technical limitations and creative freedom, with the battle being started all over every time new technologies became available. More important, they defined their work as grounded in the concepts of both Piet Mondrian and Marcel Duchamp.

During this time, in painting, spatial limitations of the particular, human, real world have generally given way to a concern with a conceptual simultaneity of space-time. Mondrian sought "a truer vision of reality" by destroying the particular of representation, thus liberating space and form in terms of equilibrium. By a mechanical destruction of the particular we believe it possible to approach anew this problem. We seek a new equilibrium—an equilibrium on a temporal frame as in music. And we seek a balance of contrasting plastic movements.

...We discern a creative advantage here similar to that deliberately sought after by both Mondrian and Duchamp however opposed their respective point of view; Duchamp, an anti-artist, and Mondrian, seeking a purity of plastic means.

...The devices of art and music which have made Western art forms possible, originated in antiquity and have evolved slowly paralleling the life of that culture. The introduction of the machine in such proportions as has taken place only in this century constitutes a quantitative change effecting a distinct qualitative revolution. The motion picture camera is no more an improved paint brush than our sound track is an improved musical instrument.

It is our opinion that the work and ideas of Marcel Duchamp with his underlying principles, against hand painting, and, a studied exploitation of the mechanisms of chance, make a significant esthetic contribution to the advancement of this "qualitative revolution."<sup>1</sup>

Computer animation is not normally associated with the Dadaist movement, but the Whitneys propose a strong theoretical influence. Combine this with Mondrian's idea of fluidity, and one can sense that the Whitneys have never been satisfied with the boundaries imposed by conventional ideas on film. The impetus for this outlook occurs because their ideas about film and art come from outside the world of film. This is where the link with Belson is made.

Belson likewise refuses to rely on the film medium itself for his own work. The power of his films relies on the movement of color in real time to convey the feeling he is trying to get across. "At this moment I would say my work is more influenced by ideas that derive from the worlds of painting, graphics, and music than from the world of motion pictures. I feel more like a composer and a painter than a film producer."<sup>2</sup>

The type of work produced by Belson and the Whitneys has sparse antecedents in film. Oskar Fischinger was important, and Belson acknowledges it. According to Belson, Fischinger extended spatial boundaries on film, but did not go as far as Belson's work. Without elaborating on why the effect was different, Belson argues that Fischinger dealt with earth space while Belson was concerned with outer space.<sup>3</sup>

Fischinger's images treated geometric, uniform shapes, which flowed in patterned movements. These movements usually followed the rhythm of the marches and other songs he used for sound tracks. "Fischinger worked painstakingly on numerous colourfully abstract films, all of which had a remarkable purity and brilliance. The movements were based on sound, as with Hungarian Dance (1931) from Brahm's composition of the same name, while in An American March (1939) they were linked to Sousa's 'Stars and Stripes Forever'.<sup>4</sup> However, Fischinger's use of geometry, color and sound would lead the way to even more radical ideas about film composition.

The combination of geometry and color related to sound points to a fluidity in the work of Belson and the Whitneys that distinguishes them from most other filmmakers. The obvious reference point is Mondrian; but, another one—significant and drawn from the world of painting—is Kandinsky. Kandinsky dealt with abstract geometric forms that



conveyed movement in his paintings. He drew much of his influence from musical tone. It was his style that was important, rather than any particular painting or time period. However, it's easy to hold up a few of his paintings as precursors to certain film concepts. "Composition 8" (1923) shows distinct shapes colliding with each other on what appear to be several different planes, while "Cool Wedges" (1929) highlights two pentagons in a shaded area with simple lines in the lower part of the picture to evoke the presence of buildings and telephone poles. "Accompanied Contrast" (1935) shows colors and shapes melting into each other in the foreground of a flat surface, but "Grill" (1935) is concerned with triangles and rectangles linked by the white lines used to outline them on a dark surface. These observations, however simplified and randomly picked, give an idea of Kandinsky's importance.

A parallel of Kandinsky's influence from painting is the musical composition of Arnold Schoenberg. Schoenberg was a proponent of serial music composition, a concept that John Whitney acknowledges as an influence.<sup>5</sup> Schoenberg wanted a painter like Kandinsky to paint the sets of the proposed filmed version of his *Die Glükische Hand*, although Schoenberg himself was also a painter. Their professional association came mainly from "their common belief that music and color touched identical responses in the human soul through different sensory receptors."<sup>6</sup>

Kandinsky's work focused heavily on the relationship between color and music, and their reciprocal movements. He wrote a stage composition called *Der Gelbe Klang* which attempted to capture the relationship between sound and color. Although neither artist's proposal was actually produced, they remain very significant influences.

Both works were spectral fantasies speaking directly to innermost feelings, and both attempted to communicate within a realm of poetic feeling without recourse to either psychic motions or the intellect of vision, hence their fundamental distinction from expressionism...

Both were attempts at truly synthetic works of art in which color, movement, and sound would fuse in the spectator's mind to form a single expressive phenomenon, and through their successive interaction would arise a new order of aesthetic experience."<sup>7</sup>

John Whitney and Jordan Belson have taken these ideas to their logical ends—however different from each other they may be—more than anyone else. (James Whitney cannot be included, as he no longer makes films. He refused to accept the time period a filmmaker must endure between his initial effort and the final outcome; he now works with ceramics, after making *Yantra* in the 1950s and *Lapis* in the early 1960s).

Both Whitney and Belson are dismayed with the prominence of narrative film. Whitney bemoans its failure to interact with art, and Belson regards it as a phony method of implying reality. Both relegate it to the level of story-telling—not that of art. The message from them is clear: the individual has to look beyond the screen itself to understand the implications of what is being projected. Whitney put the dilemma of narrative film into artistic perspective:

It seems to me that, really, in this century in art the important things are kineticism and abstraction. Though there has been a great flowering of drama in motion pictures. Drama on film has held the front stage all through this time to the exclusion, and blinding us to a much broader perspective of the whole spread of filmic arts. Cinema does also point toward abstract moving arts, the kind of arts that offers some sort of parallel to our experience with music. That's putting it in a terribly Messianic way, but theater is story-telling and so on, and all those traditions are breaking down and at the same time the plastic arts have established new areas, have carved out new domains. And that was the thing about Mondrian, who was pointing out his concepts of pure plastic and plastic art, dealing with form in its purest sense, with the vertical against the horizontal.<sup>8</sup>

There was this meager and very, very insignificant tradition in film. Like Oskar Fischinger, the people at the Bauhaus, Schlemmer, and, of course, Hans Richter, Viking Eggeling, all these people were abstract filmmakers. Then also Kandinsky, though he did not get involved in filmmaking. Kandinsky, practically the first real abstract painter, was tremendously interested in music and his painting is very much influenced by his ideas of music...<sup>9</sup>

Belson is more dogmatic than Whitney in arguing about film and these issues. The difference between the attitudes and perceptions of each artist's films lies in the connotations that their respective works present. Because of their precision of movement and flow, Whitney's films take on an aura of art made by technology. Also, his films' origins in computers cannot be ignored. Belson, on the other hand, uses images that conjure up primal associations and deal heavily with mythic ideas. Belson's films seem baffling and eerie because their images probe directly into archetypes that are recognized by all of us.

Thus, it makes sense when Belson derides conventional filmmaking:

You have to realize the camera lies. And the fact that the photographic image is accepted as a close facsimile of reality is not so much propaganda from Eastman

Kodak as the logical culmination of the perceptual history of our civilization. Maybe it's unfortunate that film somehow got into the grip of narrow-minded people not intellectually or aesthetically capable of comprehending that reality is more than a photographic image. For them, the medium is used for story-telling, as an off-shoot of theatre or literature, and the whole technology has been designed to substantiate that.<sup>10</sup>

About his own work, he says:

Such ideas can be better expressed through the perceptual senses rather than the intellect. It's a language in which the words, or the visual images, combined with sound contain allusions to a wide variety of phenomenological experiences, but on such a vast scale and with so many magnitudes at the same time that there's no time for analytical understanding.<sup>11</sup>

Both Belson and Whitney have taken filmmaking to its extremes, utilizing concepts that surpass conventional thought in the medium. Gene Youngblood calls this vision Synaesthetic Cinema, "the only aesthetic language suited to the post-industrial, post-literate, man-made environment with its multi-dimensional simul sensory network of information sources."<sup>12</sup> It's a McLuhanesque vision of kinetic energy in art, and its kinaesthetic effect has "the manner of experiencing a thing through the forces and energies associated with its perception."<sup>13</sup> Both Whitney and Belson can be described by these ideas. They are using their medium to arouse a feeling in others—with means generally neglected in the past.

In filmmaking itself the main forerunner to this was Hans Richter. "Richter's first film, Rhythm 21, was a kinetic composition of rectangular forms of black, grey, and white. Perhaps more than in any other avant-garde film, it uses the movie screen as a direct substitute for the painter's canvas, as a framed rectangular surface on which a kinetic organization of purely plastic forms was composed."<sup>14</sup> But, Richter's Rhythm 21 did not emerge from a common personal experience; it only offered the opportunity to be entertained by a kinetic composition.

Both Whitney and Belson deal in images that are derived from personal experience. Belson states, "I first have to see the images somewhere within or without or somewhere. I mean I don't make them up. My whole aesthetic rests on discovering what's there and trying to discover what it all means in terms of relating to my own experience in the world of objective reality."<sup>14</sup>

Once this is achieved, Belson then brings the viewer with him. "I want to cause the viewer to travel with the artist, even go through areas that are, in a sense, non-material places, although the sense of moving through them is very real."<sup>15</sup>

Though Whitney's computerized work seems to be very aloof from any emotional inspiration or feeling, a sense of warmth pervades his films. His earliest films, in fact, made with his brother James, relied on the filming of overlapped stencil cards to create an image of motion—although he now uses an IBM 360 computer. His goals are so developed that he has spent a great deal of time developing the technology as a means to an end:

It is important to explain that I was not motivated to create representational images with these machines but, instead, wanted to create abstract pattern in motion. Since 1940, I had found myself devoted to the concept of an abstract visual art of motion structured in time, having for some years reflected over and over again upon the extraordinary power of music to evoke the most explicit emotions directly by its simple patterned configurations of tones in time and motion. The tendencies of much art of this century toward abstraction and kinetics served to reinforce these views during many moments of serious doubt of the validity of my own concepts."<sup>16</sup>

Both filmmakers situate themselves apart from the technical limitations imposed by their method of art, because it is the art they are striving for.

Art, even the simplest, is the expression of truths too complex for science to express, or conveniently express. This is not to say that science is in some way inferior to art, but that they have different purposes and different uses. Art is a human shorthand of knowledge, a crucible, an algebra, a tremendous condensing in the case of great art of galaxies of thoughts, facts, memories, emotions, events experiences to ten lines in MacBeth, to six bars in Bach, to a square foot of canvas in a Rembrandt."<sup>17</sup>

And, ten minutes of film.

Aware of the limits imposed upon him, Whitney felt he could extend them to further his own art. "From the very beginning, we had no aspirations to copy the existing animation techniques, because we looked upon abstract filmmaking as somehow an art requiring technical innovation. We felt from the very beginning that we were tied up with art and technology and had a very conscious way of looking at our relationship to technology."<sup>18</sup>

Belson relates, "I reached the point (in filming Samadhi) that what I was able to produce externally with the equipment, was what I was seeing internally...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."<sup>19</sup>

The machine is a tool in creating the art. Both filmmakers have used this tool, in different ways, to reach new points in the art of filmmaking where no one has ever traveled before. They are pioneers, and draw their inspiration from outside the traditional forms of cinema.

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## Reviews, Notes, and Notices

Paul Sharits at Carnegie Institute  
Roger Jacoby at Pittsburgh Film-Makers

The boundaries of cinema were substantially set seventy-eight years ago at the turn of the century. Cinema, film, movies, are projections on a screen in a darkened hall, with or without sound, the images bearing the weight of a developing theme or idea. Reproducible like all works of photography, the same film can be shown to thousands of spectators in scores of theaters hundreds of miles apart. The spectator sits in the dark, watches the screen, while the celluloid ribbon that carries the images moves from one reel to another in the projection booth. Twenty-four frames per second, the illusion of movement—cinema.

Recent challenges to this basic formula include the paracinema sculptures of Barry Gerson, the "hologram movies" of Amy Greenfield (see below), and Anthony McCall's projector works. Additionally, there are the "frozen film frames" of Paul Sharits and Roger Jacoby's Original Films.

For a decade Paul Sharits has been making "flicker films," works largely consisting of frames of pure color—sometimes magnified so that the moving grain is visible, sometimes manipulated so that the frames slip across the screen, or the shutter seems to slow below the speed of invisibility. Little noted is another, important aspect of these films—their "frozen frame" companions. Had Sharits possessed the financial means, he would have issued frozen frame versions of all his films beginning with Ray Gun Virus (1966). Initially scored on paper before filming begins, these films can also be exhibited in this format—suspended between sheets of plexiglass, restoring the initial grid framework that one can only generally sense in watching the film projected on a screen. All of his films, Sharits said in the discussion after his September screening, ought to be seen in these two modes, the spatial format of the frozen film frame, and the temporal format of the projected film. Each clarifies the other, both expand the limits of what cinema can be.

Among Roger Jacoby's new films, screened in November, were four of his "Originals," works made in camera (and also processed by him), that are not intended for duplication. This seemingly arbitrary distinction is not just a gesture against the fundamental reproducibility of the photographic image. Copies are not, he asserts, equal to the originals. And these originals are not as fragile as conventional films. On "extra tough, long lasting Estar film," these movies are mounted on a film stock so strong that, if trouble arises, the projector is more likely to break than the print. As unique and durable objects, Jacoby contends the Originals ought to be valued apart from the pricing system that applies to most other films, which are, in effect, issued by editions, rather than individually. Yet he also derides this alternative, through his decision to sell the films by foot—like tradesmen who three-quarters-of-a-century ago bought and sold Melies and Lumiere not by the subject but by the length of film on the reel.

—R.A.Haller

Amy Greenfield at The Museum of Holography and  
The Experimental Intermedia Foundation

Motion pictures as a concept can be traced, depending on one's interests and inclinations, from Eadweard Muybridge, E.J. Marey, Thomas Edison, Emile Reynaud, or the Lumiere Brothers, to cite the principal figures. Significantly, half of the work connected with these "inventors" of the medium was in the area of short duration "movies" in which motion was limited to a gesture or two (because the image support, usually glass, could hold only a small number of pictures).

"Short" films of contemporary film-makers usually are too long, even when they are in loop form, to successfully allude to the magical intensity of those works (pre-cinematic to some observers). Two exceptions are Less by Hollis Frampton and Eye Myth by Stan Brakhage; the latter, the longer, has 190 frames.

Amy Greenfield's holograms evoke the pre-cinematic apparatus of Reynaud and Muybridge but more strikingly revive the excitement and impact of a gesture that can be analyzed and then reanimated. Gestures, moreover, that the spectator knows were filmed with the intent of expressing much in very little time. One can find a great deal in something as brief as these ten to thirty second pieces.

Greenfield's holograms are of two kinds. At the Museum of Holography she exhibited a 360 degree work called Fine Step in which the artist rises, turns, and thrusts her hands out towards the viewer. At the Experimental Intermedia Foundation (also in December) she additionally presented a 120 degree work with dancer Susan Emery turning before the spectator, raising her arms from her lower right at the beginning, to the upper left at the end.

So described the holograms sound quite modest. They possess, however, additional qualities which make them of unusual interest. Fine Step, made in collaboration with Hart Perry, is twice the length of standard 360 degree holograms; the image support is

curled around twice so the spectator seems to see a double exposure, but after a complete turn of the hologram it becomes clear that the "second" image is a continuation of the first—that to watch the hologram is to simultaneously see two discrete moments in time, moments that are linked by Greenfield's body in two different positions in space. This superimposition was mutually developed after Perry suggested a partial overlap of the images, and Greenfield suggest total overlap. The resulting work unfolds out of itself so effectively that the end/beginning slips by almost unnoticed. Fine Step looks like an animated, transparent Moebius strip.

Fine Step has another aspect that is remarkable. Unlike the great majority of holograms that are photographed at a neutral height of about four feet with film plane parallel to the subject, this Greenfield-Perry work was filmed with the camera higher, far above eye level, and tilted looking downward. As a consequence, when Greenfield rises and turns towards the camera, and reaches, it is as if her hands extend beyond the hologram as they approach the camera. Space-time in this hologram is thus manipulated twice: as Greenfield reaches out to our time, we can look back into her past.

In the second hologram, Saskya with dancer Susan Emery, the superimpositions of Fine Step are not present. Instead, Greenfield uses the ends of the image support as parts of the work. At the extreme left edge of this discontinuous hologram Emery emerges out of a chaos of color, rises and rotates, reaching towards a complementary burst of light on the right. Saskya is more involving than Fine Step because the work is motionless, something which can be animated only if the viewer walks to the right or left, and this leads to an analysis of the dancer's movements that the continuous rotation of Fine Step discourages. Greenfield's fascination with the motion studies of Eadweard Muybridge is hardly surprising after observing Saskya. Within the context of her films and video works made earlier in this decade one could almost predict Greenfield's sure command of this new medium. Progressively less complicated, more fundamental, all of her work has led in this direction of still moments in dynamic balance.

--R.A.Haller

Stan Brakhage at Carnegie Institute and  
Pittsburgh Film-Makers

Scheherazade performances are no doubt rare in most times, except perhaps as fictions or myths. If, however, any contemporary filmmaker might be considered to approximate that extraordinary lady's output, Stan Brakhage would certainly be a prime candidate. Her survival, one may recall, depended not really on quantity, but on quality above all.

In the 1976-77 work screened at PFMI this October, Tragodeia and The Governor seem to represent the most extensive treatment of two long-standing Brakhage concerns—modes of abstraction and representation in film. Tragodeia (translating literally as goat-song) is about goats, Brakhage family goats to be exact, past and present. Iconographically the film relates to the fascination with birth processes and the life-cycles of the "natural" world familiar to us from numerous other Brakhage films. Formally it belongs with that group of films wherein a single or very similar set of central images are employed and then undergo elaborate visual/temporal transformations (cf. Wonder Ring, Song #27: My Mountain & Rivers, Text of Light, among others).

The action in Tragodeia is goat life, specifically one cycle of menstruation, fertility, pregnancy and the birth of the next generation. Color footage is cut together with older black and white imagery of past events and members of the on-going goat family. This content is given us through an extraordinarily complex and elegant rhythmic, cinematic structure built up through superimpositions and repetitions of light, color lines of movement, etc.—that cinematic "dance" which is Brakhage's particular gift. There are traces of narrative line in the birth "event" but so layered and interwoven with multiple moments from other points of view and times that they become inextricable. This allows Brakhage's conception of the recurrent, inevitable nature of such events to dominate the film.

The familiar tension in much of Brakhage's work between specificity, spatial, temporal (and combinations thereof) and its dissolution, is present in Tragodeia, but in a fundamentally unifying manner. It seems one of the most celebratory films in Brakhage's oeuvre. I thus found it rather curious to be reminded several times by its rhythms and "tone" of Anticipation of the Night, made over 20 years before, about a contemplated suicide. In the earlier film, however, that "tonality" is achieved largely through elaborate continuous, repetitious camera movement and a montage structure carefully integrated with that set of camera strategies. The filmmaker's role as creator and constructor is thus kept before us almost constantly whereas Tragodeia's structure seems almost self-generating in that the elaborate camera activity and editing are here supplanted by an exploitation of the printing possibilities inherent in the film medium. Like Anticipation the film has a very continuous flow, but a smooth one, lacking much of the charged, constantly shifting, disorienting qualities of the earlier work—the latter, of course, more appropriate to its potent subject matter of impending death.

Brakhage has often remarked in various ways that for him film must never come to a "stop" (i.e., consistent with his concept of cinema as analogue to the processes of vision, perceptual and conceptual which cannot "stop" either, until death). Tragodeia seems to achieve that continuity and fluidity in a manner appropriate to its presentation of natural world events as recurrent, inevitable and ultimately beyond human intervention. It is also appropriate that the filmmaker's presence is far less evident in the new film. Animal life simply "happens," while the sphere of human events is far more complex and generally less peaceful by far.

At the other end of this spectrum is The Governor, a documentary to be sure, but quite different for instance, from any of the films comprising the Pittsburgh Trilogy. This film too makes extensive use of printing possibilities, employing at the same time traditional kinds of shooting and editing familiar in the documentary tradition. Brakhage has put it together in several large blocks, each a different event within which he orchestrates the flow with great care.

There is a longish scene of a meeting in Governor Lamb's office, involving several government officials seated at a huge and elegant wood table. The scene is shot largely into the mirror-like surface of that table, thereby presenting the event through reflection images. Brakhage describes the process of shooting this scene with six differing color film stocks, threading up and discarding and returning to the stock he felt appropriate from moment to moment. It is a bravura performance and he considers the procedure to have given him the "broadest palette since the Songs" (made in the late 1960s). It also has the effect of minimizing our consciousness of the filmmaker's presence, and producing the effect of this film, like Tragodeia, generating itself out of its own particular properties as cinematic medium.

As a type of documentary the imagery is highly manipulated rather than predominately representational, a formal choice again consistent with the filmmaker's themes. Brakhage was not eager to do the film by his own account. And simultaneously he admits to a certain fascination with politicians. What comes out of this is a meditation about "imaging" on several levels. The politician is the ultimate actor, always "on stage," and that is primarily how we see the Governor; few private moments are offered.

The most highly manipulated and intense section of the film is the scene in a television broadcasting studio, where Governor Lamb and his wife are about to go on the air. All the forces of image-generation converge here—the politician, the mass media and the observing filmmaker. Unlike the Pittsburgh films however, involved with confrontation of certain relatively non-visible areas of genuinely life-and-death situations, this film is about the manipulations of "image," political, cultural and as "art." There are serious questions here as to their interrelationships, what may be considered "real" in all 3 areas, and who or what forces are calling which shots?

The two films form an interesting juxtaposition—separating rather decisively the spheres of human vs. "natural" events. And clearly it is The Governor in which "vision" in all its ramifications for Brakhage is confused and/or deceptive and unreliable as a basis for constructive knowledge of the world. These are not new themes, but seem here greatly clarified. The early longing for a place in that seemingly easier "natural" world has been laid to rest.

To turn briefly to Sincerity (Part II): we find a relatively linear, narrative autobiography made from black and white "documentary" footage sometimes even shot by other people. For this film Brakhage seems to make of himself a sort of compiler of historical material, and the film falls somewhere between the highly personalized mode of much of his previous autobiographical work and the relative "objectivity" of what we generally associate with documentary film style.

Taken together these three longer films suggest some interesting shifts in Brakhage's concerns—some new thoughts perhaps on the knotty, tiresome business of realities and illusions and his many years of discourse on such issues through juxtapositions of abstraction and representationality.

It has been a long haul out of 19th century Realism with its attendant assumptions in all the arts. Perhaps like much work of the 1970s these films signal a new path for explorations into the territory of representation, without the weighty historical baggage of mimesis. Frederic Jameson, in discussing Gertrude Stein, remarks that her writing "neither solicits visual perception nor haunts the mind with the symbolic investment of depth psychology. We cannot, therefore, interpret these sentences, but we can describe the distinctive mental operations of which they are a mark... ."1

Such description has been Brakhage's project for a quarter century, as indeed it has been the concern of most modernist art. It is no accident that after 50-odd years of avoiding "interpretation" of the sort Jameson describes Stein's work as precluding, that it now seems possible to explore our production and consumption of representational imagery as simply one area of "distinctive mental operations" acknowledging its particular potency, especially in photographic media. Perhaps that potency is something like the kind of

reassurance Jameson ascribes to the conventional "novel of plot," i.e., that human life is somehow a "complete, interlocking whole, a single formed, meaningful substance."<sup>2</sup> Brakhage's apparent acceptance of the impossibility of such a description of "life" or "reality" seems to be leading him to a re-telling in a very different form of the "story" (his, as artist, husband, father, etc.) we've become familiar with over the years in very different forms. It remains to be seen—as Sincerity continues to unfold—where the Dog Star Man will lead us now. The exploration unquestionably continues if the terrain, inevitably, has changed.

—Wanda Bershen

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