## Beyond Spatial Montage: Windowing

**Or The Cinematic Displacement Of Time, Motion And Space**

### An Overview

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This is an overview of the expanded field of spatial montage and other visual forms to be published by Focal Press.

# *Foundations: Links Between Time, Motion, and Space*

The typical cinematic image (either in long take or montage form) appears in the absence of additional constraints: the 'pure' form of Motion is the long take (undisplaced movement contained by the long take); montage/editing are each a 'pure' form of Temporal displacement, apparent through the ruptures created by the cut; the 'pure' form of Spatial displacement lies with the use of multiple projection-a use that forms a range lying between apparently discrete screens and the composite screen produced by aligning the edges of one projector with another as in cinemascope or Able Gance's Napoleon. Distinguishing between time, motion, and space in a theoretically precise manner allows for a more robust theorization of windowing: the distinction between one dimension and another is instantly apparent in the affect resulting from watching the motion picture itself. Each of these dimensions can be readily distinguished from the others through our encounter with it on screen: the affect it has determines its location within this taxonomy.
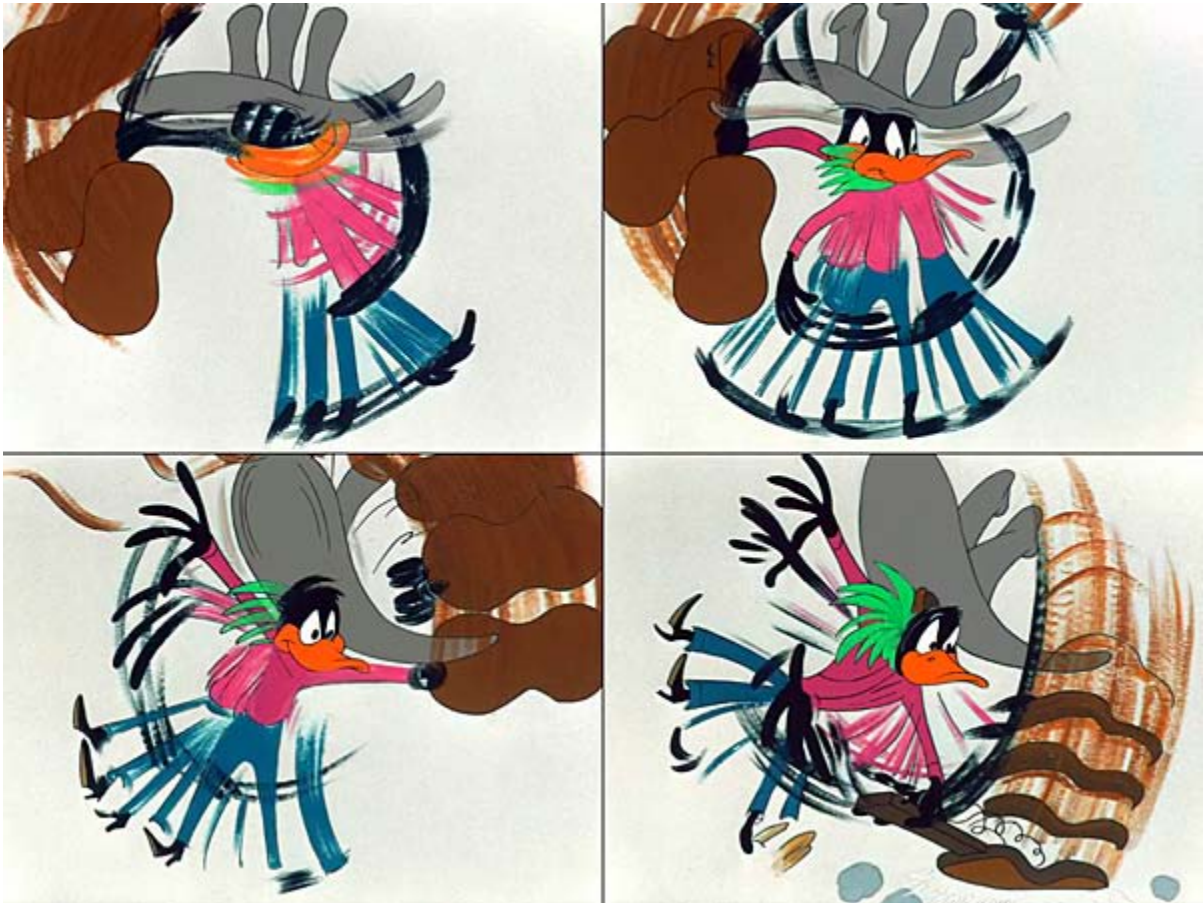
**TIME**

Time Displacement is the repetition and fragmentation of the duration of what appears on screen, either within discrete parts of the frame, or by replacing the entire image shown on screen. Works organized around the manipulation and modulation of Time are the easiest to recognize since the 'time' of what appears is constructed through discrete shots pieced together. Motion picture employing editing (and montage) to construct the work from discrete, singular units juxtaposed in a temporal sequence, one after the other. All the varieties and variations of editing-Soviet montage, Hollywood's system of continuity, graphic matches, etc.-function as a basically identical method: the assemblage of discrete, short durations in a linear sequence that decompose motions and displayed actions into smaller units. The various theories of montage, such as those of Eisenstein, Pudovkin, et. al. are all systems focused on the organization and combination of these short shots over time.

The interruption of continuous motion that the edit inherently is results in a dramatic shift in space and perspective on screen: each image appears as an entire replacement of what was on screen previously. The relationship between individual shots emerges within the minds of the audience; every shot is singular, the degree of its disruption simply being an exaggeration of the underlying sequential nature of images in a motion picture-where normally only small differences appear, resulting in motion, with sufficiently large differences, the change becomes a change of shot. Situations where the differences are less dramatic, or in which only a few elements change result in scenes that are transformative in nature, seemingly unedited.

**MOTION**

Motion Displacement is the repetition and fragmentation of continuous movement whether occupying the full frame or contained by smaller 'windows.'

In its basic form, the element of "motion" appears as continuity of action and movement on screen. The long take, with its emphasis on this continuous sequence of motion on screen (and in consequence much longer durations than employed in continuity and montage editing) structures the motion picture very differently than editing does.

Still frames showing motion repetitions of Daffy Duck shattering his guitar in Duck Amuck (1953) directed by Chuck Jones.

What disruptions that do appear are a function of the sampled nature of animated imagery generally. The short series of frames where Daffy Duck shatters a guitar in Chuck Jones' *Duck Amuck* (1953) -might appear to be a "cubist" repetition of movement when seen as a sequence of stills, however, they are not cubist. The duplications of Daffy in these frames are accompanied by streaks that suggest exceptional speed; this short sequence is emphatic in its destruction of the guitar, the speed is a performative consequence of this dramatic function-it occupies barely Â¼ second of screen time before returning to normalcy. While the technical means-replicated imagery within the frame-might resemble the displacement of Cubo-Futurist painting, or even the step-printing effects that appear in Norman McLaren's film *Pas De Deux* (1968), the brevity of the sequence, coupled with its use of streaks signifying high speed motion as well as the affect it has within *Duck Amuck* argue against such an understanding. The sequence does not seem to be displaced at all during the film-instead it merely appears as a moment of highly dramatic motion. A fifth frame presents an almost complete return to normalcy after Daffy has shattered the instrument-only a single 'echo' of his motion appears, and the dramatic gesture is essentially over. Any similarities to Cubo-Futurist fragmentation of motion are a reflection of the influence that Jules-Etienne Marey's chronophotographs had on Marcel Duchamp's work in particular, such as the *Nude Descending a Staircase* (1912). These repetitions within a single frame act as a representation of high-speed, continuous motion that movies faster than 24 frames per second, the standard for sound film. The repetitions that would under other circumstances qualify as 'echoes' in this case appear instead as greatly accelerated movement; the rest of the sequence before and after this group of four frames proceeds normally. However, these few frames do demonstrate the continuity between standard, continuous motion and the shift into displacement: it is a matter of degree and affect, not necessarily an inherent difference in technical means.

Where editing acts as a structuring of multiple, discrete and independent images over a specific duration, in the long take, these distinct images become instead the continuous motion of the mise-en-scene as shown by a series of fluid camera positions all contained within one shot composed to avoid or minimize editing entirely. Orson Welles' *Touch of Evil* (1958) opens with an extended long take whose action runs in 'real time'-the duration set on the timer that appears at the beginning of the shot ends at the first edit in the film-the resulting explosion. The action of the sequence is focused on the impending explosion, even as the

action shown proceeds through an elaborate mise-en-scene produced by a tracking crane shot that introduces Vargas and his wife, as well as gives a portrait of what the boarder town where the film takes place is like. It is the specifically continuous nature of this action that heightens the drama of the sequence-as it is happening in real time-the duration set on the bomb and the duration of the actions shown are identical-as the timer runs out, the sense of watching events play out that audience has increases until the edit that literally interrupts Vargas and his wife on their honeymoon. This dramatic use not only of the continuity of motion within the long take, but the disruptive impact of editing is precisely the focus of the sequence as a whole.
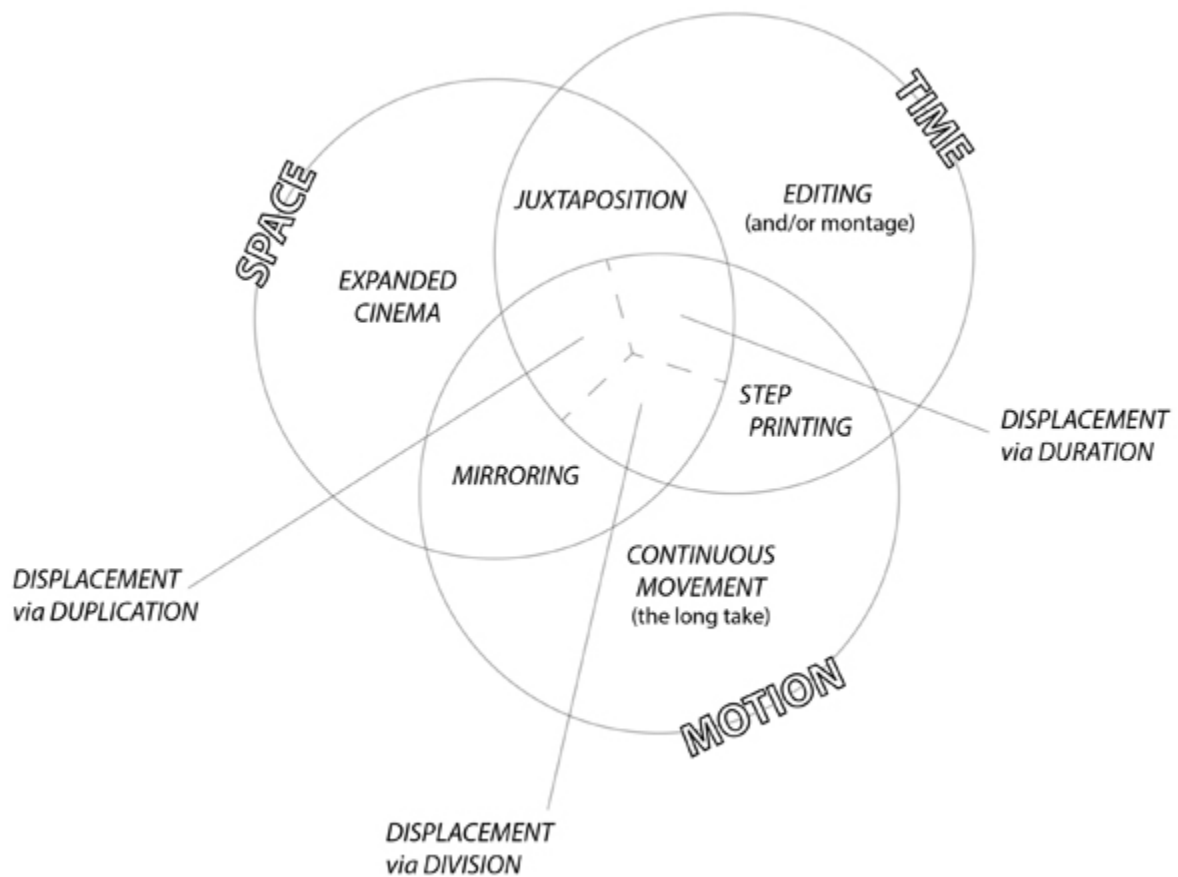
## SPACE

Spatial Displacement is the visual repetition and fragmentation taking the visual form of discrete 'windows' on screen either within a single frame or through multiple projection.

What matters is the affect the work has, as either a singular screen or multiple screens. Most common in expanded cinema and the multiple screen film/video installation, Space modulates between appearing as a single screen and being self-evidently composed from multiple screens. The distribution of the screen/image across and into physical space defines this dimension explicitly. Most commonly a result of multiple projection, it can assume the shape of a single screen where the different projectors are aligned to enable the illusion of a single image (as with Able Gance's *Napoleon*), or may be explicitly composed from individual screens arranged together (as with Stan VanDerBeek's *CultureIntercom* and video installations generally).

"Expanded cinema" is the most common label used for the deployment of multiple independent cinematic screens within a single environment. Depending of their arrangement-relative position and proximity-these screens may produce exactly the juxtaposition effects identified with 'spatial montage,' but without being composed on the same screen. These effects depend on the same spatial character as discrete frames of imagery sharing the same screen, and should be recognized as being within the same morphological and structural range.

The shift from a represented space within the imaginary volume shown on screen to the physical space in front of and around the screen-is the shift into a cinematic form focused on actual spatial relationships, not only between images shown but between physical surfaces inside the "movie theater" where the screening happens. This is a shift that spatially expands from the flat screen into the potential for multiple screens in actual physical space. It is simply an issue of degree of difference between one screen-surface and another. The displacements and juxtapositions that arise are a function of this physical separation, but at the same time they are simply an intensification of juxtapositions happening on screen with windowing and 'spatial montage.'

The shift into physical space from the graphic space contained by the screen is a logical extension of the morphology and structures of juxtaposition and repetition. It is a relationship that enables the recognition of the spatial dimension that organizes both types of displacement, making the differential between combinations of Time-Space and Motion-Space (i.e. the 'space' element in itself) formally and conceptually legible as a distinct formal component in the construction of meaning in these hybrid cases.

**COMBINATIONS**

Although compound and complex variants of these types of displacement are possible, this analysis will exclusively focus on and discuss them in their 'simplest' variety in order to make their formal characteristics readily apparent. The distribution of multiple screens containing different, discrete images throughout an actual physical space (i.e. an environmental installation employing a variety of screens) while not directly addressed by this taxonomy is potentially contained by it in spite of their readily apparent differences: multiple screens or a single screen, the organization of imagery within that screen (and in relation to other screens) will still function in analogous ways.

The hybrid cinematic forms that emerge when combinations of Time, Motion and Space act to determine the morphology and structure of form are agnostic: they do not necessarily dictate any particular protocols for interpretation, nor do they impose precise, limited meanings on these formal organizations of motion picture material. It is this openness to interpretation that enables the vast range of applications that are possible for the materials described by this taxonomy. This foundational trio of general tendencies that when combined follow a different internal logic than when acting as independent, singular concerns. These hybrids that lie in the combination of basic elements are where the development of 'spatial montage' and all its related forms are to be found. The expanded field of such relationships, as well as their relationship to well theorized and understood cinematic techniques (long take, montage) as well as their role in the interpretation of cinema (governed by the priorities of realism) is not a morphology whose foundations are the logical extension and expansion of existing morphologies that have historically given rise to these forms because they offer alternative means to achieve identical ends, posed in the realist demand that organizes cinematic form generally.

The technologies of compositing and image combination directly contribute to the development of juxtaposed imagery. While the production of composite imagery is evident in the history of motion pictures since the first Trik films were made in the 1890s, the relative rarity of these images-even within the Trik film-remained relatively constant due to the difficulties of their production. The greatly reduced costs, coupled with relative ease of production with digital video has made the integration of live action, animation and

graphic design via compositing a common feature of motion graphics and commercials even though it remains relatively unusual in narrative production.

| Basic Elements | Affect of their Combination | |
|---|---|---|
| Time—Space | Juxtaposition | Multiple Image (Spatial Montage) <br> Intermediate Combinations <br> Single Image <br> Iconic Synthesis (Superimposition) |
| Time—Motion | Step-Printing | |
| Motion—Space | Mirroring | |
| Time—Motion—Space | Displacement | via Duplication <br> via Duration <br> via Division (Einbau) |

The distinction between different potentials within the range of these forms is a function of the on-screen affect of the materials combined. For narratives with live actors and edited sequences of shots, these potentials have a more limited application. The apparent division and fragmentation of the screen into smaller, discrete units in narrative works remains unusual even as similar forms appear more frequently in the commercials and title sequences accompanying these realist fictions.
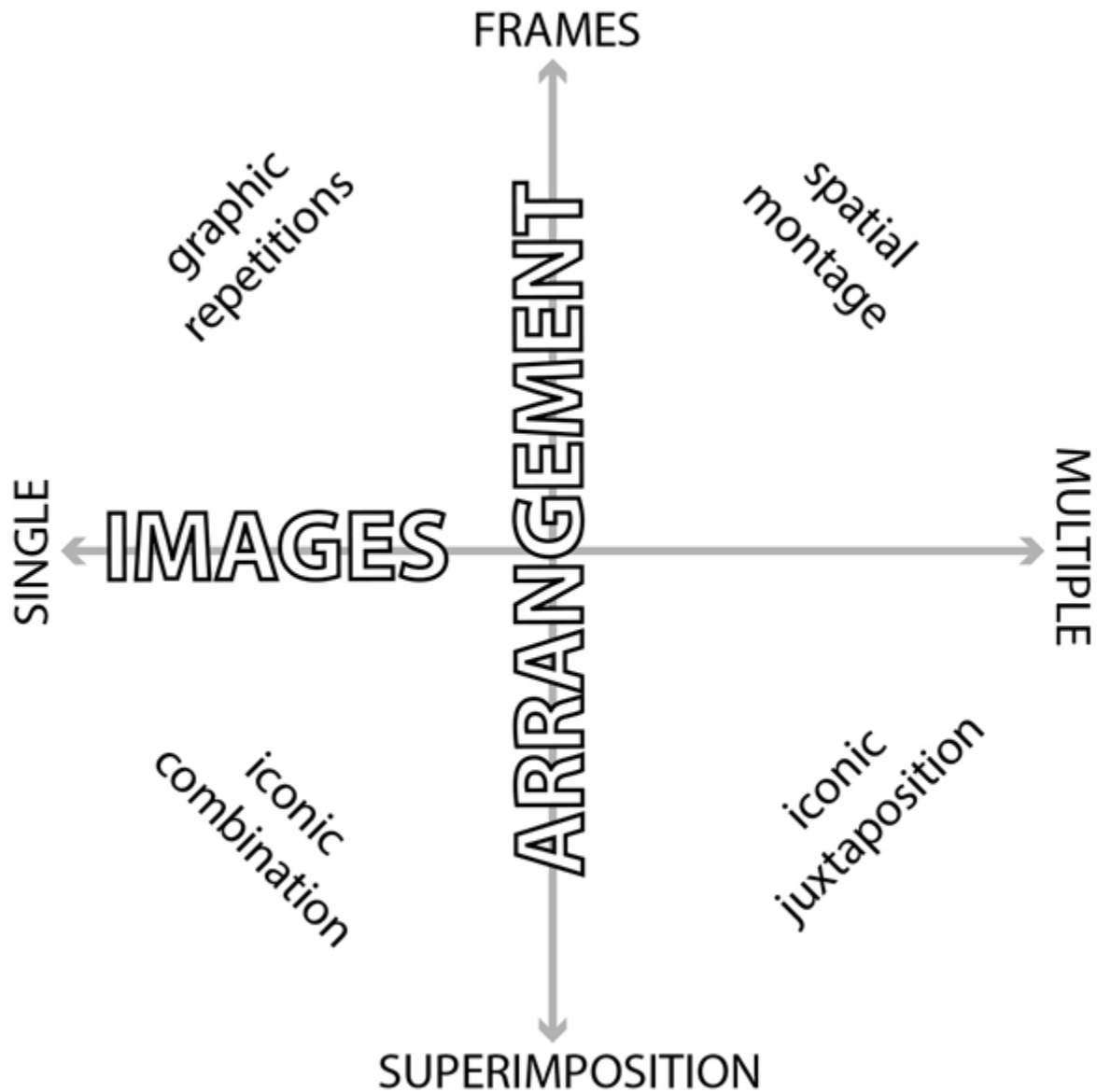
This heuristic composited, juxtaposed imagery is taxonomic in nature, empirically developed from studio-based research, historical observation and logical analysis. These limiting factors give the resulting framework a robust basis in practical application-observational and descriptive, the taxonomy enables the recognition of mutually interrelated positions. This organizational framework is not dialectical in nature. The logical completeness the taxonomic form proposed in this analysis allows for both extension and hybridity specifically through its heuristic application. The significance of the forms it describes, their meaning, is not only a function of formal structure. It depends on the specifics of the imagery and its temporal development with a larger work. While the formal organization on screen may be decisive in this interpretation, its role is necessarily secondary to the particulars of image, development, and narrative function: meaning is not an a priori given in the resulting semiosis.

Ambivalence and ambiguity are common features of purely formal analysis that develops independently of hermeneutic constraints. This uncertainty is precisely the goal in the current analysis. The description of formal structures in themselves should not result in inherently appended meanings, since to attach signification requires the exclusion of alternative potentials; thus necessarily limiting the analysis only to evidence that supports a determinant meaning within a specific logical structure.

## Time-Space Displacement

The morphology of Time-Space displacement is a complex matrix of potential relationships: the quantity of single- and multiple-images that are juxtaposed, and their spatial relationship either as discrete units within a larger frame, or iconically as the entire frame itself. The morphology of these forms within this field is arranged between from structures of maximal difference towards structures composed by similarity of imagery. The morphology of juxtaposed images is not a matter of the distinctness of individual 'subframes' within the composition, so much as it is an issue of whether these images have the affect of displaced imagery. Affect is crucial-the audience identification of one pair of composited or superimposed images as being juxtaposed, and

another pair as being a single, continuous image without juxtaposition is sufficient to distinguish between those shots that employ Time-Space displacement and those that do not even when both employ superimposition or compositing.

FRAMES

graphic repetitions

spatial montage

SINGLE ←IMAGES ARRANGEMENT→ MULTIPLE

iconic combination

iconic juxtaposition

SUPERIMPOSITION

The matrix of potentials in this type of displacement reflects the degree and quantity of images on screen, as well as their differences with each other: the simplest forms of Time-Space displacement are described by "split-screen" where two shots play at the same time and superimposition where two shots are overlaid onto each other. Both forms emerge by 1910, employed by Emile Cohl in his animations; the distinction of Cohl's uses from Time-Space displacement depends not on their technique of production, but on how the audience understands them as being continuous, singular shots-effects reinforced by the composited shots' role in his narratives (c.f. The Next Door Neighbors where the two adjacent rooms are understood to be spatially linked even if their imagery is not).

These formal effects are uniformly developed in motion pictures whatever their technologies might be. Video art explored many of these effects using analog technology, independent of the demands posed by realist cinema; for narrative cinema, this form is commonly employed to display simultaneous events at different locations on screen at the same time. This presentation of simultaneous events simultaneously is the most familiar type of Time-Space displacement because it has been the most frequently used narrative application-one that meshes with the demands of realist cinema most completely. The continuity of duration in these dramatic narrative applications reinforces this realist use by employing long takes in the variously

windowed compositions, whether as a simple pairing in "split-screen" or as a much more complex arrangement with multiple shots positioned on screen.

The range of Time-Space displacements described below are extreme positions within a spectrum of possibilities that have intermediate and overlapping examples, rather than mutually exclusive structures. Distinct approaches can be distinguished by their subject matter: one employs a singular subject shown multiple times (potentially from multiple viewpoints), while the other combines different subjects, juxtaposing their imagery on screen in a graphic fashion. he spatial displacement of imagery (typically individual, discrete images) creates juxtapositions and relationships between the images that enables a narrative understanding of them as coincidental. The distinction between the two variants of this approach depends on the materials being combined-one employs a single image in a graphic fashion, repeating it without a temporal displacement on screen; the other composes multiple, different images on screen at the same time.

**Multiple Image Juxtaposition (Spatial Montage)**

The juxtaposition of Time-Space displacements emerge from the collage-like arrangement of discrete images of multiple, different subjects together on a printed page; it was formally developed by magazine paste-up, advertising, and graphic design. This variety of windowing has received the most theoretical/critical discussion. These works are specifically composed from multiple, discrete, independent images that have been assembled on screen to create juxtapositions of material. Formally linked to the multiple screen presentations of expanded cinema and video art, spatial montage is displacement based in juxtaposition of several images, typically of different subjects coexisting side-by-side, each discretely bounded and arranged together (often) following a rigid grid.



Stills from the title sequence for *American Look,* designed by Robert Mounsey, Charles Nasca and Otto Simunich for Chevrolet (1958).

The displacement of spatial montage have an entirely different affect from the displacements common to the Cubist-derived morphology created by repetition. Historically spatial montage has been difficult to produce, requiring either an animation stand or the optical printer's compositing capacities, making it both expensive and comparatively rare. Their appearance in newsreels that were already heavily using optically printed sequences is one of the few places where this type of multiple image juxtaposition and compositing was common. With the ease of compositing with digital tools the graphic juxtaposition of discrete moving images distributed across the frame as individual spatial fields has become much more common.

**Intermediate Combinations**

Intermediate positions between multiple image works juxtaposed on screen and works with singular repeated shots arranged graphically are possible. A single subject filmed multiple times, perhaps from a variety

of similar angles, or even from the same fixed position multiple times, can be presented in an arrangement where the result is clearly a Time-Space displacement, but the affect is not juxtaposition but is instead related to repetition without being the strict reproduction of identical shots. These works are fundamentally linked to the historical, fragmented structures of Cubist painting.



Stills from David Hockney's "experiment with film" produced for the documentary *Portrait of an Artist: Hockney* (1983).

These displacements are focused on a single space/subject that is then subject to being presented through an array of multiple views, coexisting and simultaneous, and it is this singularity of subject matter that distinguishes the first variation from the second.

**Single Image Juxtaposition (Graphic Repetitions)**

Repeated imagery composed and arranged on screen produces a Time-Space displacement but does not require the production of multiple long takes: it repeats a single shot, and uses it multiple times, forming complex arrangements that juxtapose identical imagery. The simplest variants of Time–Space displacement transform a singular image to create a pattern of identical elements typically composed in a grid. Of the two potentials for Time–Space displacement, repetition commonly employs single images rather than collections of divergent imagery; the spatial repeating of the single shot creates a continuous field of imagery that acts to emphasize the graphic character of the image rather than the uniqueness of visual contents. Juxtaposed imagery is secondary to the continuous pattern formed.
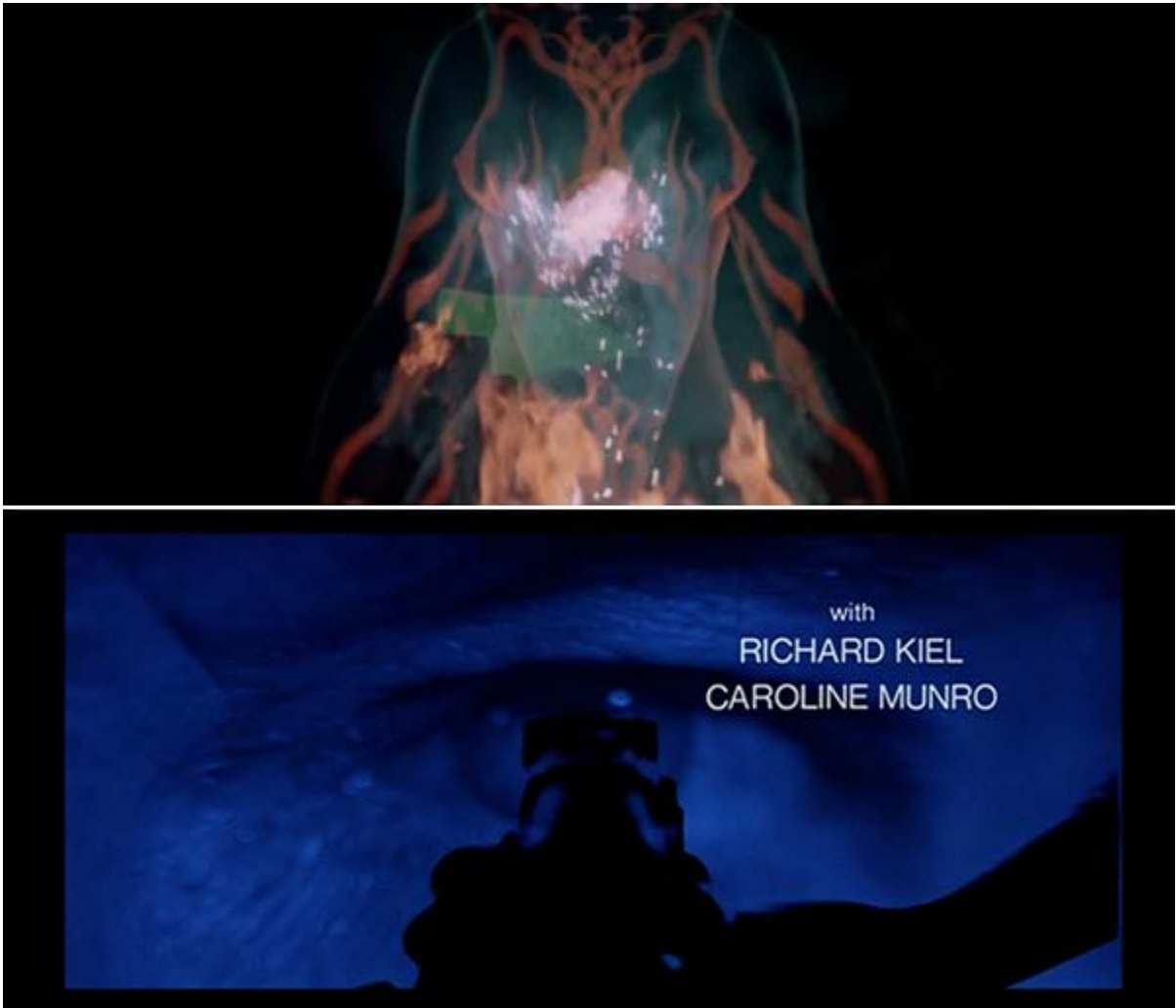
Stills from *The Thomas Crown Affair* (1968) showing repeating imagery in the "polo sequence" designed by Pablo Ferro.

The graphic repetition of identical shots is the focus of this subvariant of Time-Space displacement. Grouping similar actions on screen within unrepeated montage or dynamically in complex compositions in both cases remains subservient to the narrative demands imposed by their context. This narrative function is determinant of both formal organization on screen, selection of imagery to repeat, and the meaning those repetitions have. While these applications are linked to graphic design, in particular the Modernist advertising design of the 1950s and early 1960s, in a motion picture their function (narrative role) dominates their construction. This subservience to narrative is a common feature of commercial uses for the full range of Time-Space displacements.

**Iconic Synthesis (Superimposition)**

Still within the realm of juxtaposed imagery, but distinct from both the single shot subjected to graphic repetition, and multiple framed images composed in a spatial montage is the iconic image created by superimposition. There are two variations of this iconic construction: those produced by multiple image combinations superimposed over each other (iconic juxtaposition), and those produced by single images superimposed over themselves (iconic combination) and functioning as intereference patterns. The production of these iconic images is uncommon in the history of motion pictures. While the superimposition has been possible since the beginning of cinema, appearing in "Trik Films" as a technical strategy during the 1890s, the Time-Space displacement appearing in these shots only seems slight: it is produced by the audience's

recognition that these shots would not normally be possible-that there is no potential for these images to be the product of an unmanipulated long take. Thus while the technique of superimposition is quite antique, the affect it must have must be one where the imagery combined creates a visual synthesis, rather than being a realist combination of images to produce the illusion of a singular continuous shot.



Stills showing iconic synthesis: (top) *A View to A Kill* (1985) designed by Maurice Binder showing an dancer producing an iconic combination; (bottom) from *The Spy Who Loved Me* (1977) designed by Maurice Binder showing eye-gun iconic juxtaposition.

The same set of potentials appearing in discretely framed compositions apply to the full-frame superimposition: compositions juxtaposing both single imagery and multiple imagery can be produced as full-frame superimpositions. The distinction of these effects from the use of superimposition in long takes depends on the affect these combinations have: they do not produce a seamless continuity, instead generating their form through the contrast between the images used. Even when a single shot has been doubled onto itself, it must have the visual effect of being displaced, rather than an illusory combination that asserts the continuity of the singular image; this simple distinction enables the separation of superimposed elements within a long take that function as realist continuity and the superimposed elements that result in a dislocation of imagery. The creation of 'iconic' imagery through superimposition is a common feature of both advertising and title sequence design.

The subservience of Time-Space displacement to narrative is the common application for these structures, whether they juxtapose, repeat or otherwise combine imagery on screen. They enable the presentation of simultaneous actions as happening in congruent spaces on screen without the need for cross-cutting or the traditionally parallel editing that conveys the same information sequentially. By allowing the presentation of simultaneity in a continuous fashion on screen, the Time-Space displacement recreates the affect possible on the nineteenth century theatrical stage: the presentation at different points on stage of simultaneous events. In this regard, the collage-like features of these images are secondary to their capacity to

create spatially discrete points of contiguous action on screen; the combinatory potentials juxtapositions offer in avant-garde film, for example, is a minor development parallel to the primary, narrative application in commercial cinema. This narrative function is so dominant that the earliest examples of juxtaposition produced by superimposing two shots on the same film strip, at once familiar and antique, is difficult to recognize as belonging to this range of Time-Space displacements.

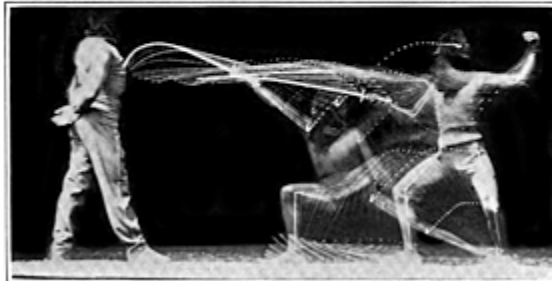## *Time-Motion Displacement (Step Printing)*

Time-Motion displacement is part of the foundational history of motion pictures. This type of sequential photograph, *the chronophotograph,* invented by the French scientist Etienne-Jules Marey, is immediately recognizable as representing a temporal shift where an identical, multiple-yet-singular formal structure of displacement is created entirely within a singular full-frame image. This displacement achieves a distinct juxtaposition and fragmentation of time and motion that is different in character and degree from 'spatial montage'-the spatial element extending across the screen, is incidental to the organization as it is motion that characterizes these repetitions. This displacement of the duration across the screen as the individual motion 'echoes' violates the continuous long take in precisely the same way that editing and other forms of montage do, but without breaching the integrity of the individual shot. Superimpositions produced with an optical printer (or using video/digital processing) can produce a visual displacement called "step printing" that transforms the chronophotograph into a motion picture.



A pole vault in all its more interesting stages.

A hurdler in action.

The displacement of a fencer's body and arm during action, showing how a graph can be obtained.

A standing broad jump made with the aid of dumb bells, showing how weights aid the athlete.

Georges Demeny, studies of human motion from "The Human Body in Action," *Scientific American,* February 7, 1914.

Step printing employs a single take as the foundation for a new image, one where the motion contained in the individual frames of that original shot is presented simultaneously on screen, producing visual effects similar to those shown in the Demeny photographs (above). The image is made by repeating the same footage in a superimposition, but using an incremental advancement between repetitions; this the "step" in 'step printing.' It transforms the already filmed action of a shot into raw material for new animation where the initial imagery is juxtaposed with its own path of action and development. The emphasis in shots of this type is on the development and progression of action as extended over time across the screen. The spatial element of Time-Motion Displacement, while inherently a part of the work, is insignificant; the image on screen remains singular. The affect of these 'echoes' is immediately understood to be both simultaneous and indicative of multiple images coexisting on screen at the same moment-the tendency to interpret this kind of image as indicative of 'the infinite' suggests an understanding of the images shown as multiple-yet-singular.

Ways to automate of the step-printing effect have found few direct applications in commercial film and video production until the 1970s, but are abundantly common in Video art. The repeating imagery

characteristic of video feedback displaces its form within the frame, but repeats that form with a varying degree of immediacy, a reflection of the latencies contained by the technology, ranging from instantly to after a tiny delay. The closed-circuit loop of camera watching its own output creates mandala-like forms from the repetition of the phosphor dots in the video screen-an element that may be a factor in its rapid adoption and deployment during the "psychedelic era." It is a readily accessible technique for processing imagery using the video camera. Video feedback that integrates imagery, (rather than the autonomously generated visuals produced by a camera-monitor loop whose images emerge 'purely' from the interaction of pixel and camera), will also produce a similar series of Time-Motion displacements.

A similar relationship appears with the visual repetitions characteristic of some types of digital glitch (such as datamoshing) that produce another variation on the form of these Time-Space displacements. These repetitions however, do not have the affect of hyper-fast motion that exceeds the standard frames-per-second speed of film or video. These bits that remain in place imply a Cubist-like composition of shards, each showing a discrete moment in the development of the image-motion transformed into graphics. The difference between fragmented time and fragmented space lies with the overall composition of the materials combined on screen.
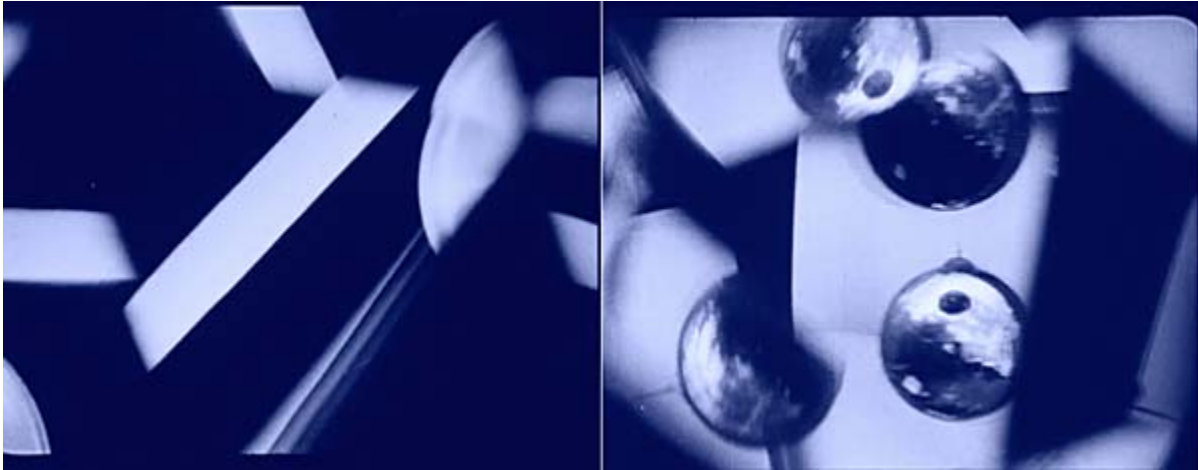
The digital imagery generated by this process is broken into discrete blocks that repeat across the screen, visual traces created by the parts of the image in motion across the spaces where there is no movement. This 'dragging' of form behind the leading edge of the motion element recalls the same chronophotographic repetitions appearing in Marey's works-it is a technological artifact that not only has the same visual affect, but is representational image of how the motion was digital encoded in the file: as a discrete sequence of unique positions in motion over time; normally invisible, the changes to the video files' data makes this fragmentation visible. Time is displaced spatially within the image.

## *Motion-Space Displacement (Mirroring)*

The most easily identified variety of Motion-Space displacement, a tessellated array of (typically) triangular images, is immediately recognizable as being kaleidoscopic. However, any mirroring, even a simple vertical 'reflection' on screen creating a symmetrical pattern would qualify as a Motion-Space displacement. These simple forms are the most common: mirroring is the earliest form of windowing to be developed since the visual structure happens continuously in 'real time' since it does not require the motion picture as technological support-as a result, the first examples of this displacement are pre-cinematic. They appear in the eighteenth and nineteenth centuries as developments in kineto-optical devices (both photography and the motion picture are also examples of these scientific concerns). While a simple 'split screen' (two images) would not be an example of this technique, if it were instead a mirroring of the frame (so long as it was not a superimposition of the frame flipped horizontally or vertically) it would qualify as the simplest variety of Motion-Space displacement. Complex versions with multiple reflections, often resembling a kaleidoscope, are more readily identified versions of this visual displacement.

Time is not displaced within this visual structure since the duration and timing of the visible material remains synchronized and simultaneous throughout the frame (a factor that distinguishes it from the displacements of video feedback that often reveal a delay, however slight). The Scottish physicist Sir David Brewster created a device for producing this type of imagery with The Kaleidoscope, patented in 1817 [Figure 18aâ€"c]. His term for the device and the type of imagery it produced is derived from joining several words in Greek: "kalos" meaning "beautiful" + "eidos" meaning "form" + "scope" meaning "to see."

The organization of optical elements that produce the displacements-reflectors or prisms creating reflections-guarantee the simultaneity of all motions and the continuity of reflections throughout the entire field of view in a continuous field of simultaneous action, each sample mirroring each other instantly. This immediacy is the determinant of Motion-Space displacement. Brewster's initial design is not only typical of later designs, it fully encompasses the systems developed for motion picture cameras. The continuous nature of the time shown makes the graphic and spatial displacements appear to be linked-all displayed actions spread simultaneously across the various framed elements. The most common constructions use three mirrors or prisms, set either to form acute angles (60-30/45-60) or equilateral triangles (60-60-60). Different quantities and angles of mirror combination create imagery based in a network of reflections-depending on the size, number, and angles of reflection, the variety of imagery generated by these constructions will vary greatly. Consequently, each type of apparatus produces different kinds of imagery.

Motion-Space Displacement from *Ballet Mécanique* (1924) showing kaleidoscopic reflections.

Motion-Space displacement tends to be dominated by decorative kaleidoscopic imagery, and consequently its applications in motion pictures-the use of these displacements as flourishes is a translation of the abstracting quality they present. That it is also unquestionably the earliest form of visual displacement makes its uncommon nature in this decorative mode entirely logical. The principles of Brewster's optical device are well known, as is the kinesthetic character of the decorative abstractions it was designed to produce. The general neglect these forms have received, compared to other types of displacement, may be a reflection of the transformation of the kaleidoscope from entertainment to children's toy.

## Time-Motion-Space Displacement

Displacements of Time-Motion-Space are predicted by this taxonomy, but do not appear in the historical record. These are 'single image' works constructed around the fragmentation and reorganization of one shot (the long take) transformed into a multiple image composition that may not contain affective juxtapositions. The three variations of this displacement reflect affective priorities in the form that the resulting composites take within the larger morphology of Time-Motion-Space displacement. Both temporal and spatial elements are crucial to these visual structures; they differ from 'spatial montage' in the singular nature of the screen-image. There are three variants distinguished by their affective character: within the fundamentally continuous, singular image the shifts have a distinct valence that is more closely aligned with one of the three elements (Time, Motion and Space).

This structure compartmentalizes parts of the motion image contained within a single long take, transforming the time shown by that shot so its development and temporal progression on screen becomes graphically visible within discrete sub-images. Each of the three variations of this structure employ a fundamentally consistent organization of materials in relation to the continuity of the long take: the singular image is broken into smaller frames that function as "temporal lenses" allowing a simultaneous presentation of different moments from that singular duration on screen. This variety of displacement allows for a detailed consideration of a singular temporal development: the displacement of Time-Motion-Space depends on the recognition that what has been manipulated is a singular image, its contents and development displayed spatially, but simultaneously developing across the frame. Each of the subvariants function in analogous fashion, but manipulate this temporal element in very different ways, creating a group of unique affects that cluster around a singular general form. These subtle distinctions distinguish each variation.

### Displacement via Duplication

Duplicated elements within the singular frame exploit the serial nature of motion imagery-that each motion picture is composed from a sequence of very similar images presented individually in rapid succession; this technical foundation remains true of digital videos as much as traditional films, even though digital files do not typically encode individual frames in their entirety. The presentation of all these works, analog and digital alike, depends on this multiple presentation of discrete images to create their motion. This technical foundation remains constant whether they are projected on film or created by selectively changing particular pixels on screen: the audience sees the image as a whole, not an atomized collection of discrete points of light.

*Chipmunk* (2006) is a movie where a short video of a chipmunk eating a walnut is fragmented and shown multiple times as distinct moments of the action are duplicated and arranged on screen. The entire duration of the original video footage, running approximately 5 minutes, is shown on screen, but has been "compressed" through this repetition into 2 minutes. Time is condensed through the duplicated elements of the same long take appearing on screen at the same time, potentially summarizing the chronological development of the entire shot in a singular frame: these discrete duplications are all drawn from different points within the progression of a singular shot, but are shown simultaneously on screen. The resulting piece allows for a consideration of nuance and action by its animal subject while at the same time containing an entire sequence of action. This condensation of action, development and movement results in apparent, visibly repeating actions that allow comparisons of how the action develops in time. Creating the fragmentation this condensation of time on screen requires an accompanying spatial displacement that creates an array of discrete images whose morphology is immediately recognizable as the temporal displacement of how the shot develops. While this structure in a still image might resemble the juxtaposed imagery common to spatial montage, the affect this compositional structure has is entirely different. It is the audience's recognition of the how each image fragment is a distinct moment from within the same, immanent, singular long take that defines this particular displacement as duplication of materials from another temporal point in the same shot's development: the structural affect is displacement on screen rather than juxtaposition, making its distinction from spatial montage clear and immanent.

## Displacement via Duration

Time-Motion-Space displacement via shifts of duration within an otherwise continuous image is another logically potential morphology identified by this analysis which does not have a historical foundation. Instead, it is one of the structures predicted by this taxonomy as logically possible; it is a 'discovery' posed by this research. The organization of material on screen within a continuously running long take is subjected to internal displacement by changing the duration of some parts of this long take, so portions of the image become ruptures with the rest of it. These delay-structures are difficult to recognize as still images precisely because they are formally continuous with the rest of the frame's contents, but the movement they display is displaced in relation to the rest of the frame's contents: instead of taking a much longer duration and condensing it into a shorter time, a shorter time is expanded into to be much longer. This effect is produced by speed ramping to artificially create both slow motion and fast motion. Speed ramping digital motion pictures creates the possibility for the duration of the scene to expand and alter, creating a different temporal effect within the image.

*Rabbit* (2005) breaks the screen up into a network of discrete frames that progress at different rates, creating a tension between slow-moving and fast-moving elements. The action of the rabbit shown-eating a plantain flower, then hopping away-becomes through this process of repetition and slowing of footage a study of the action itself. These displacements on screen have the capacity to emerge from or disappear into the normal speed motion of the image, resulting in displacements that link with and diverge from the continuous motion contained by the rest of the motion image.

## Displacement via Division (Einbau)

"Einbau" is a German word that means "installation" and "mounting"-two simultaneous understandings that emerge from this particular visual construct when encountered in motion. While it superficially might resemble 'spatial montage,' is distinct from it in two ways: first, the images function not as smaller units within the larger field of the frame, but instead are clearly coincident with it-they are recognized and understood to be full-frame images, of which only a piece is visible at any given moment. This form is specifically derived from rarely occurring digital file malfunctions, or glitches, where instead of a change of shot occurring, instead the two images combine on screen, coexisting yet entirely separate from each other, each contained in a fragmentary fashion and understood to be full-frame. That all images in an Einbau are full frame is the point-what appears on screen is a 'window' that acts as a displacement within that full frame, showing parts (and these selections may be in motion within that full frame over time), resulting in a clear awareness that the two images coincide, and can be seen in simultaneity, but remain distinct.

*Coming and Going* (2014) is a short made from multiple 30 second long takes shot with a stationary surveillance camera using the einbau structure. These shots have been composited together to accentuate temporal ruptures within the spatially continuous space shown on screen. It develops the structural dimensions of the einbau displacement in a systematic fashion. The ruptures within the long take are instantly understood when watching the piece. This video employs a series of 30-second long takes each produced at a different

time of day, but showing similar actions from a fixed camera position (the footage is taken by a security camera mounted in place). The displacements form an even grid spread across the screen, effectively interlacing paired and grouped shots in a seamless fashion: only incidents of light and action identify where these squares are on screen. Again, it is immediately apparent that all these shots are full frame images; however, the fragmentation and combination of action produces an ambiguity of temporal relationships by presenting the distinct shots as specific divisions within the space of the long take, each corresponding to independent times, thus distinguishing the einbau structure from the other variations of Time-Motion-Space displacements.

## *Afterword*

The potential of on-screen structures that appear as displacement is at once a deeply under theorized, but at the same time over-determined. The same series of structures are shared by both the avant-garde and commercial media "worlds." The failure of existing theorizations originates with those theories' demand that the displaced structures of windowing be essentially critical, ignoring the alternative uses that are apparent within commercial media production. The uniformity of this morphology that allows both collage/montage-like juxtapositions and seamless constructions of realist continuity demonstrates the independence of these structure's meaning from their formal organization: these on-screen structures function at a more basic level than that posed by the interpretations of narrative or the combinatory potentials of montage-like forms. Developing a conceptual map to accommodate this range of forms thus becomes a necessary prerequisite for any hermeneutic critical assessment.

The morphology of windowed structures employment in commercial media is entirely different than those same structures' uses in 'experimental' or 'avant-garde' media. The distinction between them is not an issue of formal structure and development. Nevertheless, the particular displacement techniques most commonly appearing in commercial cinema and television are those whose formal organization of material can readily be assimilated to the illusionistic and discursive demands of realisms it has been historically employed in dramatic cinema. This subservience of the formal aspects of displacement to those demands imposed by the realist drama for the presentation of simultaneous action lends to those structures the semblance of an a priori meaning: that their only meaning must depend on their use within realism.

The ruptures that 'experimental' and 'avant-garde' media then pose for these forms-specifically as violations of this realist practice-reinforces the rhetorical division of formal techniques between those associated with realism and those employed by its critics. Oppositions of this type assume a dialectical form, resolving the ambivalence of a given morphology as ideology. They reproduce the supposition that to be formal is to disengaged critically, and is corollary that critical engagement denies the need for a thorough formal analysis noted by Bois. The particular shape (morphology) that a given form takes may be constant across a variety of works, but this organization of materials does not imply one meaning-or another. Formal techniques are ambivalent: they are enablers for interpretation; they constrain the range of plausible interpretations for the materials they contain. How these constraints develop, what they imply through their organization-these are related, but distinct problems to address.

Realism provides a fundamental reference point for the elaboration and development of windowing historically, both in commercial media and elsewhere-those works that develop in works that do not employ the realism of commercial cinema are often representative not just of an alternative approach-they are constructed and theorized as an oppositional practice, one where realism serves as the formal and aesthetic being 'negated.' Replacing cinematic theory and historical concerns with those imported from the 'art world' situates the resulting films in the realm of art, with its specific aesthetic interpretive protocols and critical hermeneutic mythologies. As these are developed from the analysis of what are static works-the development and transformation of painting and sculpture is not typically a function of duration in the same ways that the development of motion pictures, dramatic theater, and music depend on time as a functional dimension of the work's form: we do not normally speak of the duration of a painting, or the total running time of a sculpture, (even though there are exceptions). The deployment of 'art world' concerns as the interpretation of these motion picture works is a reflection of the dualism that structures these analyses-the oppositional positioning of some works in relation to a 'dominant narrative cinema.' Shifting the terms for the historical foundations of 'experimental cinema' from the concerns of cinema (or motion pictures) to those of painting enables a reification of the oppositional relationship at the level of praxis, thus necessitating distinctions between the

works at a fundamentally formal level, but without requiring the demonstration of them as distinct forms.Replacing cinematic theory and historical concerns with those imported from the 'art world' situates the resulting films in the realm of art, with its specific aesthetic interpretive protocols and critical hermeneutic mythologies. As these are developed from the analysis of what are static works-the development and transformation of painting and sculpture is not typically a function of duration in the same ways that the development of motion pictures, dramatic theater, and music depend on time as a functional dimension of the work's form: we do not normally speak of the duration of a painting, or the total running time of a sculpture, (even though there are exceptions). The deployment of 'art world' concerns as the interpretation of these motion picture works is a reflection of the dualism that structures these analyses-the oppositional positioning of some works in relation to a 'dominant narrative cinema.' Shifting the terms for the historical foundations of 'experimental cinema' from the concerns of cinema (or motion pictures) to those of painting enables a reification of the oppositional relationship at the level of praxis, thus necessitating distinctions between the works at a fundamentally formal level, but without requiring the demonstration of them as distinct forms.

The invisibility of denials, especially when they readily appear within analysis as an autonomous form whose morphology and structure can be taken as givens, gives the resulting argument a dialectical nature: concerned with the development of alterior forms, the absent denied form becomes their negative-it is everything left over. Such a construction is formative of both sides in this duality, yet it is one where a precise morphology remains elusive-the absent denied form only takes shape through its relationship to what is defined, rather than being directly analyzed in itself. The necessity for such a logical structure to avoid a close examination of the 'dominant narrative cinema' becomes apparent and inevitable. By constructing its argument in this fashion, it is incapable of making these connective relationships an explicit element of the experimental work's form. These morphologies and structures must remain independent, parallel, and unlinked.

Neither thinking that 'formalism is everything' nor 'formalism is irrelevant' has a role for an engagement with the morphology and structure of cinema. Both claims have a ideological basis that guides both interpretative and aesthetic engagements with motion pictures; these antithetical positions also pre-form the understanding of the historical record in ways that are incompatible with the type of analysis that forms this taxonomy. The need for a descriptive analysis of the range and relationship of multiple-image works in juxtaposition to both traditional editing and the long take is self-evident from the disparate and fragmentary theories and analyses of 'spatial montage' and its parallel theorizations. The empirical dimension that structures this analysis is one where new potentials can emerge from logical analysis and consideration of how the demonstrative uses of existing works might be organized.

What results in this analysis is a formal description that is fundamentally subservient to the demands of interpretation even as it is independent and separate from those demands: it functions at a lower level of interpretation, but is determined in advance by the higher level concerns of meaning. The interdependence of specific form framed by specific interpretive horizons renders the particular, developed historical uses legible in relation to more heavily theorized concepts such as 'cinematic realism.' These higher level concerns have determined which potentials have been developed and which have not, as well as their roles in interpreting the resulting works. The formal element (morphology) in this discussion is essential, but plays a secondary role akin to grammar in verbal language: it organizes its materials invisibly, rendering those materials comprehensible. Considering the morphology employed in historical motion pictures creates a foundation for more complex semiotic analyses. It is the foundational organization that makes these considerations possible.

## *Buy the Book!*

For a complete discussion of windowing and the related forms of spatial montage, expanded cinema and their uses in commercial cinema and connections to realism, you should purchase the book from Focal Press.