10. Signatures of Motion: Len Lye's Scratch Films and the Energy of the Line

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Line, no matter how supple, light or uncertain, always implies a force, a direction. It is energon work, and it displays the traces of its pulsation and self-consumption. Line is action become visible.

Roland Barthes, “Non Multa Sed Multum”

After a decade-long hiatus in which he mostly produced wartime documentaries and military training films, Len Lye in the 1950s once again began using the technique of direct animation that he had helped pioneer more than twenty years earlier. These previous films, such as Colour Box (1935), Colour Flight (1938), and Swinging the Lambeth Walk (1939), develop what Lye calls a “sensory-ballet” in which abstract forms and music are knit together with color to produce sensations of motion.¹ The point was to create a sensual experience of pleasure generated through color whose abstract and direct appeal avoided narrative forms and the kinds of associations that Lye believed plagued realistic imagery. In the early 1940s, Lye stopped producing these films, in part because of the war and an increasing scarcity of financial supporters and in part because of his growing interest in politics and a desire to counter Nazi propaganda films.² However, when invited to submit a film to the 1958 International Experimental Film Competition in Brussels by his friend Alberto Cavalcanti, Lye produced a direct animation but moved away from painting bold colors as he had done previously. Instead, he scratched into black 16mm film stock to produce lines, points, strokes, and zigzags that frenetically move across the screen and play not only with two-dimensional space but also with depth perspective, as some forms twist and rotate on the z-axis. The resulting film, Free Radicals (1958, revised 1979), is an ecstatic celebration of energy that elides any
kind of figuration and instead embraces a profoundly chaotic abstraction. Producing this film was no simple task. Because of the small scale in which Lye was working, he explains in his writings that when making etchings into the filmstrip he had to keep the needle very still while affecting its direction by moving other parts of his body, so that the resulting movements of the line are registrations of his own kinesis. It is the energy and sensation associated with movement that, according to these writings, he conveys through these films, generating formally innovative works that also open spectators to a new understanding of motion and how it is sensed by the body.

Such activity is achieved through a misleading simplicity of form whose expressive power has been the subject of numerous investigations into modernist aesthetics and the power of abstraction: the line. Little criticism exists on Lye’s scratch works, but what does often places them within a tradition of abstract expressionism that was popular in the artistic circles that Lye circulated through in 1950s New York. Wystan Curnow, for instance, argues that Lye’s interest in atavistic thought and ideas about a possible link between the unconscious and proprioception indicates an indebtedness to the aesthetic argued over and defined by critics such as Clement Greenberg, Harold Rosenberg, and Louis Finkelstein. Each of these critics, to various degrees, claim that the gestural abstractions of Jackson Pollock and others bare the afterlife of the artist’s unconscious subjectivity. Associating a gestural mark or inscription with the articulation of this form of subjectivity, however, is reductive of Lye’s work and, as other scholars and critics point out, the work of other artists who traditionally fall into the canon of abstract expressionism or action painting. T. J. Clark points out that though the space of Pollock’s canvases reveals an autonomous, subjective realm produced outside the force of market operations, “the marks in these paintings . . . are not meant to be read as consistent trace of a making subject, but rather as a texture of interruptions, gaps, zigzags, a-rhythms and incorrectnesses: all of which signify a making, no doubt, but at the same time the absence of a singular maker—if by that we mean a central, continuous psyche persisting from start to finish.” If we sever the associations of Lye’s gestural lines, or what he calls “figures in motion,” from the divestiture of Lye’s unconscious, what do we make of these raw, abstract lines that spin or wiggle frenetically across the screen? Why does Lye turn to this form of abstraction compared to his earlier direct animations? What is the relationship between animation and the dynamism or force of movement that Lye wishes to generate in viewers through these abstractions?
Furthermore, how do these abstract animations position cinema as a medium?

Lye posed these same questions to himself and was, throughout his career, very deliberate about the aesthetic, formal, and technological choices that he made in a variety of media. In his article “Why I Scratch, or How I Got to Particles” he explains that the lines in *Free Radicals, Particles in Space* (1960s, revised 1979), and *Tal Farlow* (1980) are meant to be formal expressions of a vitalistic energy that swirls around individuals, or “the stuff out of which we came, and of which we are.” Such forces are felt by the body according to Lye and are stored in what he calls the “old brain of our primal organs,” a localization of the body’s capacity to sense movement that has been suppressed by human evolution, and further by contemporary culture, until, he says, movement exists as a diffused and unintelligible sensation in the body. For Lye, this energy is more connected to the senses and the body than to the unconscious and repressed elements of the psyche. He explains that this energy comes from outside the body in nature, but that it is also responsible for the composition of the body. Associations or communions with this energy are what transpire unconsciously, or more exactly, outside analytic thought. This vitalistic formulation is similar in orientation to the cosmological analysis put forward by Alfred North Whitehead, especially in *Process and Reality* (1929) where he claims that all matter, both animate and inanimate, is constantly reemerging and forming, usually outside of consciousness. This process of becoming takes place through what Whitehead calls feeling, arguing that all forms of matter and life are generated out of affect and perceptual vectors, “pulses of emotion” or invisible energy that produce forms of relative unity. Objects such as rocks, people, and atomic particles affect and are affected by others and thus exist as subjects in a matrix of experience.

Lye believed that certain types of abstraction tapped into a similar sensual energy that structures the inner identity of both the body and nature. Thus, the deep drumbeats on the soundtrack of *Free Radicals* represent, for Lye, an expression of energy in the same way as the mechanistic, whirling sounds produced by his metal kinetic sculptures. For this reason, he incorporated both kinds of sounds on the audio track of *Particles in Space*. The marks and lines in his scratch films visually operate in the same manner and are oriented as modulations of energy made visible through direct contact with the filmstrip. These have a deliberate force that is often structured and precise rather than generated through techniques of spontaneity that aim to perpetually hold the sense of...
presence and articulation of subjectivity bound up, as some argue, in Pollock’s drips. For instance, in *Particles in Space*, dots congregate and sway to the sounds of one of Lye’s metal kinetic sculptures, providing an animated visual projection of its oscillations. In *Free Radicals*, vertical lines many times run down the frame to create a grid that other forms oscillate within. Other marks in the film maintain a consistency of shape as they spin on the z-axis, indicating a stronger connection to Alexander Calder’s mobiles than to Pollock’s drip paintings (see figure 10.1).

These marks and lines reveal a play not only with dimensionality and figure-ground relations but also with the material base through which these forms are generated. Though Lye was indebted to a tradition of painterly gesture and abstraction, his primary interests were in the aesthetics of motion and cinema’s privileged role as a medium in portraying
motion. This emphasis on cinema as a technological and aesthetic form best suited for conveying and playing with senses of movement strays from the notion that film is defined through a photochemical material base whose indexicality aligns it with certain aesthetic modes of realism. Lye’s frustration with this formulation that guided both film practice and the arguments made within what is now considered classical film theory influenced the construction of his films and theoretical writings on cinema and points to an alternative conceptualization of cinema rooted in graphic manipulations and sensations of movement. His focus on the body of the spectator in his films and writings and the empathetic relation between the senses and moving forms in cinema led him to produce increasingly extreme abstractions to both distill this connection’s elements and analyze their relations. In this light, Lye’s animation of graphic forms functions as a site for working through and exploring how the body sensually engages with different materials, a workshop and playground of materialist phenomenology.

Accordingly, for Lye, each type of animation contained its own specific aesthetic potentials, and scratching rather than painting lines was a key distinction between the types of direct animations he produced. The force applied to the celluloid through a technique of negation where parts of the emulsion are removed produces a work with a kinetic energy whose specificity intrigued Lye immensely. From such a seemingly anarchistic technique and reduction of form came a paradoxical explosion of vitality that Lye believed better conveyed the energy of motion relative to other abstractions. That such an exploration takes place through the abstractions and movements of the line exposes this form’s own contradictory simplicity and expressiveness. And in animation these scratch lines move wildly while simultaneously isolating a sense of force in the perceptual encounter with the viewer, multiplying the kind of dynamism that Roland Barthes describes in the epigraph to this chapter. I argue that when in motion, the permutations of Lye’s lines take on an animism that no longer simply bares the afterlife of his kinesis—the “action become visible”—but becomes a source of the lines’ own vitality and transmission of movement in viewers. The movements of the line become, according to Lye, the line’s own “life-manifestations.”

Lye was not alone when thinking through the qualities of different media during and after the Second World War. Questions of medium specificity and materiality were on the minds of a number of critics, especially within the arena of modern painting. Perhaps the most well-known, and belabored, formulation of medium specificity and the role of differ-
ent aesthetic forms in modernity came from Greenberg, a critic who has
generated both admiration and ire to the point of being so controversial
that, as Caroline A. Jones explains, his name alone sparks debates and
stands in for a number of ideas about aesthetics in a many times reductive
fashion.8 Without focusing here on this discourse and its polemics,
Lye’s abstractions and writings from this time did contain traces of these
debates, though it is clear that his interest in aesthetics and abstraction
lay in the perceptual address of his films and the variations in experience
that different formal manipulations could produce. Similar to Rosalind
Krauss’s later analysis of a medium that works through this discourse,
Lye viewed cinema as a form that participated in the construction of
an aesthetic event, but a form that was in flux historically and open to
bringing new techniques, technologies, and sensual experiences into its
fold.9 This emphasis on aesthetic effects as the final address of a medium
is apparent in the opening of Lye’s first published essay where he inverts
the primacy given to form over movement in perception: “The result of
movement is form. . . . When we look at something and see the par-
ticular shape of it we are only looking at its after-life. Its real life is the
movement by which it got to be that shape. The danger of thinking of
physical things in terms of form rather than of movement is that shape
can easily seem more harmonious, more sympathetic with other shapes
than its historical individuality justifies.”10 The consequences of such a
shift result in Lye positing “movement as a medium” whose formal in-
stantiations are more the residue of movement rather than that which
conditions its possibility. In such a framework, marks in Paleolithic cave
paintings speak to the contact of movement and also project in viewers
a sense of motion through an intuitive force. Movement exists as vitalis-
tic energy in this formulation and can be transferred through a “kinetic
kind of osmosis” between different forms and materials, or between a
body and an object, the traces of which are always visibly apparent.11
Thus, for Lye, “to extricate movement from the static finalities or shapes
which the mind imposes on living experience is to translate the mem-
ory of time back into time again — to relive experience instead of merely
remembering it.”12 Shapes and forms are not static in this formulation;
instead, they contain traces of action and duration constitutive of their
making. The movement of the hand of the artist can become embedded
within forms, and aesthetic experience is guided through a subsequent
tracing of that movement, recreating the arcs, peregrinations, and pres-
sures of the artist’s hand. This aesthetic and intuitive force described by
Lye operates through recognition and kinesthetic empathy along tactile
and optical vectors. Just as Wilhelm Worringer explains, when a spectator traces the movement of a line in visual space, “we feel with a certain pleasant sensation how the line as it were grows out of the spontaneous play of the wrist,” almost as though we had drawn the line ourselves.13

In this light, the scratches in Free Radicals exist not only as the residue or signatures of Lye’s bodily motion but also as vectors along which the energy of motion exists. The title of the film came from a New York Times article Lye had read about the existence of highly reactive and unstable molecules called free radicals, and Lye felt that his aesthetic shared these forms’ density of energy and eruptive potential.14 He also believed that the title was appropriate given his own orientation to filmmaking and persona as an artist. Throughout Lye’s career he felt a frustration with the emphasis on photographic realism in film and the continuities of space and time constructed through what he describes as “the Griffith technique.” Film, like kinetic sculpture, has a privileged ability to work with the aesthetics of motion because of the way it internalizes time. But Lye found instead that film was increasingly becoming an adjunct and illustration of literature and proposed ways of “get[ting] out of the Griffith technique” in a lecture to the Film-Makers’ Cinematheque.15 One possibility he suggested was to use techniques taken from cartoon animation in live-action filmmaking, so that a hybrid aesthetic would be generated that creatively explains how movement is composed through time in cinema.

This hybridity can be seen in some of Lye’s films, such as Rainbow Dance (1936), where colors play off one another in counterpoint as shapes and silhouettes of bodies moving about the screen dance to the musical accompaniment. His later complete abandonment of figuration was not a denial of the possibilities of this combination. Instead, this departure came about because of an increasing interest in how cinema engenders kinesthesia in viewers through the channels of empathy described above. While Rainbow Dance also aimed its address at sensual intensities, it did so through color patterns and an identification with the body on screen dancing and playing tennis. This produces a different aesthetic formation with its own specific “vibration-pattern,” as Lye put it, which here played with the differences between static and kinetic forms and the sense of movement still attributed to a body frozen in action.16

In contrast, the jerky, intermittently rigid, and chaotic scratches in Free Radicals use the gestural mark not to simply witness the body in motion but instead to feel its corporeal pressure through the lines’ moving undulations.
Several writers have examined the pathways through which lines produce aesthetic effects on multiple perceptual registers simultaneously, and in animation Sergei Eisenstein’s writings on Disney and the line are the most cited. For Eisenstein, animation could offer a spectacular liberation from social and physical laws by projecting a world whose fluidity of shape plays with subject and object relations as bodies, objects, and the environment constantly shift through a “plasmaticness” that destabilizes forms and mesmerizes spectators in the same manner as fire. Just as Lye argues, this nonrealistic motion can still produce physiological sensations, and Eisenstein similarly links animated action with a sensual address to the body. While the animated form of Mickey Mouse, or other figures in Disney films, continually morphs, the contour of such a transformation was always the line, which was responsible for viewers sensing that these figures were alive and for producing any kinesthetic empathy. Eisenstein explains that the movement and combination of abstract elements in animation are a manipulation of “heartless geometrizing and metaphysics [that] here give rise to a kind of antithesis, an unexpected rebirth of universal animism.” 17 The source of such animism is not only the projected movement of these figures, so that one believes that “if it moves, then it’s alive,” but also the observer, who endows life to these forms with both the eye and the body.18

Traditionally, the line functions as a contour or boundary, a two-dimensional abstraction that demarcates the visible and establishes figure and ground relations in a separation that usually focuses attention on the content it delimits. That said, it hardly disappears, a point that William Hogarth makes in The Analysis of Beauty (1753). He explains that the line “leads the eye” around forms in a game of chase, suggesting that an imaginary ray emanating from the eye traces the contours and movements of forms, imbuing motion to the object and to the subject as well.19 Eisenstein, possibly following Hogarth’s lead, makes a similar argument about the ways that the line affects viewers sensually, but Eisenstein recognizes how perceptual activity and attention are affected by cultural and historical circumstances and how, additionally, this context can affect the development of artworks that respond to such changes. Maurice Merleau-Ponty in “Eye and Mind,” a phenomenological analysis of painting and the visual arts, also tracks the historical nature of aesthetic encounters by showing how techniques and tendencies in different periods are oriented toward and affect the body in different ways, so that “every technique is a ‘technique of the body.’”20
In the modern art of Paul Klee the line is freed from its traditional role of articulating visible forms, of being “the apparition of an entity upon a vacant background” and now functions as a modulation of a space and according structures aesthetic experience in a different way from, for instance, baroque painting. Throughout the essay Merleau-Ponty attempts to explain the power of painting and the line, arguing that they function as vehicles for the transmission of energy, or “the body’s animation,” between different bodies of producers and viewers. Thus, painting does not produce an imaginary field of contemplation for the mind but rather a sensual one directed toward the eye.

Variations in formal choices have important aesthetic consequences when this sensual address is foregrounded. Hogarth, for example, argues that the “serpentine line” or abstract line that does not give shape to form and does not function as a contour can produce the most aesthetic pleasure because of the way it sets the eye in motion. Similarly, Worringer argues that the Gothic line that moves in and out of figurative and abstract articulations also has a fascinating vitalistic power. In Abstraction and Empathy and in his following book, Form in Gothic, Worringer argues that two fundamental aesthetic desires drive the formation of visual art through its history: abstraction and empathy. While for Worringer empathy denotes the ways in which viewers engage with artworks where a phenomenal world is reproduced or projected in a figurative manner, abstraction pulls objects out of space and time in order to purify them from the contingencies of nature, or from what he describes as the arbitrariness, entropy, decay, and imperfections that suffuse everyday life. This is fundamentally a desire for transcendence both from the world and from the body’s relation to this space. The pleasure of abstraction in this argument is generated out of witnessing a form break away from the world and become absolute in a sense, so that it is self-contained and self-perpetuating, inorganic and mechanical. Gothic lines have this kind of energy. But they are not pure abstract forms in the way that Worringer sees ancient Egyptian pictographs as being a more exemplary articulation of the desire for abstraction. Instead, the Gothic line contains traces of both empathy and abstraction, so that a vitality remains within this line that is not a hard geometric figure, but one that is labyrinthine and endless, that is jagged, and that stops and starts in interruptions and pulsations that also distinguish it from a smooth, curved line found in classical Greek art. No longer bound to the urge for a figurative representation or for an absolute ab-
straction, the Gothic line exhibits an independent will to form with its own mechanical laws and values; it has an “expression of its own, which is stronger than our life.”

This story of the line’s revolt and independence from figuration has been thematized by a number of filmmakers, most notably in Emile Cohl’s Fantasmagorie (1908) and Robert Breer’s A Man and His Dog Out for Air (1957). In these films the dialectic between figuration and abstraction through the line is literally animated and cinematically represents Klee’s famous formulation of the line’s own sense of deliberateness, which “the principle and active line develops freely. It goes out for a walk so to speak, aimlessly, for the sake of a walk.” The lines in these films never cease to oscillate, split, intersect, and take new directions, creating a geometry of peregrinations no longer solely in the service of representation. That said, their vectors still coalesce into figures whose own disintegration keeps the oscillation between abstraction and figuration moving and generates a play with expectations and form. Lye’s lines in Free Radicals, on the other hand, are forceful graphic marks lacking any kind of figuration. These lines are insubstantial, in that they delimit nothing and serve as ends within themselves. Instead, they focus on the elements and processes through which form is generated, something that Klee’s line emphasizes. In his lectures and writings, Klee explains that figuration and the projection of objects and form should not be the goal of aesthetic production. Rather, the approach to how form is constructed should be emphasized, revealing “genesis, essence, growth . . . [and] form as movement, action, active form.” Lye’s scratch lines focus on this kind of action and take on a similarly vitalistic tenor as they dance across the dark space of the filmstrip while never operating as figurative contours. These independent abstractions instead attempt to give expression to incoherent forms of energy, reveling in a figurative void.

That these lines are constructed through Lye’s bodily gestures emphasizes this point. Rather than signifying some form of unconscious subjectivity, these gestural lines articulate a play with indeterminacy and structure through the at times controlled and other times chaotic assemblage of marks. Yet the body was not the only source of energy that could generate a force upon materials. Lye locates this same power in many places throughout the natural world, describing how the abstractions seen in the cracks of rocks or in the cross sections of trees also bear witness to this force of energy in nature. His drawings and studies for his scratch animations were analyses of moving shapes affected by
this energy manifested in the natural world, such as flames, waves, or flapping pieces of cloth. But he only worked from these transcriptions to generate ideas of how this force manifests and how motion operates, attempting to project abstractions of movement rather than the contours of specific forms in motion (see figure 10.2). As Vivian Sobchack argues, the energy of the animated line as it moves across the screen is doubled. And while Sobchack’s argument applies to several types of animation, this doubled expression of force is put on dramatic display in Lye’s films, exponentially increasing an aesthetic pleasure of movement that once stemmed from his abstract transcriptions and now appears to be immanent to the projected lines, a spectacular autopoiesis.

That this energy can exist independently from the original source of movement, and even from the hand of the artist, is important since Lye believes that this energy can reside outside the body as a rhythm of vibration. Thus, in addition to producing kinesthetic responses in spectators, *Free Radicals* and *Particles in Space* aim to render visible the sources of sensation that suffuse all matter, the literal free radicals and particles in space usually invisible to the eye. This goal became particularly important for Lye in his later work, when he was simultaneously producing his scratch films and the kinetic sculptures that he began working on in the late 1950s and into the 1960s. In his article “The Art

Figure 10.2 Len Lye’s *Abstractions and Rock Paintings (‘Bush-Mine’) (1933)*, ink on paper, 113 × 178mm. Courtesy of the Len Lye Foundation Collection, Govett-Brewster Art Gallery.
That Moves” he addresses this issue directly, explaining that the energy of his sculptures, such as *Rotating Harmonic* (1959) or *Fountain* (1963–76), operates and exists independently of a perceiving body.27 Though such works house the possibility of a kinesthetic experience for viewers, they have taken on their own, independent life.

At a moment in modernism when a reexamination of ontological claims about media pressed into aesthetic practice, Lye’s films that seem to technologically strip the cinema down to its most basic elements were paradoxically an attempt to open the medium up and reveal potentialities skipped over by others. Lye’s focus on the force of energy that could be conveyed through film by scratching out kinetic movement in its surface was not for the sole purpose of reducing film’s materiality to its zero point. Instead, this aesthetic reveals what can be done without photography in film and that the medium of film is more than a projection of moving images of the world. Though there is a play with the material of film in Lye’s scratch works, he uses scratches in the black celluloid to generate senses of movement, a vitalistic activity that he argues is the medium he works in.

This is why, after many years of unsuccessfully supporting himself as a filmmaker, he turned to kinetic sculpture, since he could more easily find financial support through museums and galleries and because he believed he was performing the same kind of aesthetic operation. These works, such as *Blade* (1959), *Fountain* (1963–76), *Grass* (1965), and *Flip and Two Twisters* (1977) are composed of polished steel rods and sheets that move through concealed motors or by the force of the wind (figure 10.3). The metallic sounds produced by these sculptures are just as important as their shining visual undulations, generating an audio-visual projection of energy that articulates movement in the same way as *Free Radicals* and *Particles in Space*. *Flip and Two Twisters*, for instance, contains one loop of metal and two other straight pieces on either side of it, all suspended from the ceiling. These are twisted and attached to motors, that, when on, produce a violent thrashing and swishing to accompany the flailing metal arcs made of flexible steel. Once again, the expression of energy through the manipulation of material, by natural or mechanical forces, is the focus of Lye’s aesthetic that cuts across traditional definitions of media. The articulation of force through a work becomes the focus instead. It is this state of initial impartiality, where the force behind the generation of the mark is made visible, that Lye attempts to work through in his scratches and that sets apart this aesthetic of negative force applied to black film stock from his earlier colored lines.
painted on clear celluloid. Putting these scratches in motion through the technology of film only increases a sense of their power, as they seem to take on a living energy of their own, which, once imparted by the hand of the artist, has become independent and sovereign.

**Notes**

2. Lye was supported by John Grierson at the GPO Film Unit in the mid-1930s and was afterward commissioned by corporations, such as Imperial Airways, to generate advertisements. This complicated both the production and reception of these films, especially since they could not be distributed in the United States because of restrictions on advertising films. See Horrocks, *Len Lye*, 170.
5. Lye, “Why I Scratch, or How I Got to Particles” (1979), in *Figures of Motion*, 95. These scratch films were created and exhibited in the late 1950s and early 1960s by Lye, but he afterward stopped making films and dedicated all of his energy to kinetic sculpture, claiming that the culture of avant-garde filmmaking and

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**Figure 10.3** Len Lye’s *Fountain III* (1976). Courtesy of the Govett-Brewster Art Gallery.
exhibition was caustic at the time. At the end of his life (he passed in 1980), he revised *Free Radicals* and *Particles in Space*, but he failed to finish the revision of *Tal Farlow*. This was completed after his death by one of his assistants, Steve Jones.

7. Lye and Laura Riding, “Film-making” (1935), in *Figures of Motion*, 40.
12. Lye and Laura Riding, “Film-making” (1935), in *Figures of Motion*, 41.
16. Lye and Laura Riding, “Film-making” (1935), in *Figures of Motion*, 41.