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The dance of the hand: Len Lye's direct films

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Abstract
Len Lye's animation has a special relationship with physical materials and the body because of the ways he drew and scratched his images directly onto film. This article considers what is unusual about his aesthetic, with its emphasis on kinaesthetic styles of viewing and on 'physical empathy'. Tracking Lye's film work from the 1930s through the 1950s, it draws connections with the body-oriented aspects of abstract expressionist art. It also relates the films to Maurice Merleau-Ponty's 'embodied' approach to phenomenology. Today Lye's films need to be digitized, and that transfer raises interesting questions about the differences between analogue and digital aesthetics. What happens when his films move from the 'black box' of the cinema to the 'white cube' of the gallery or museum where they are digitally presented? The article also considers Lye's kinetic sculpture as another body-oriented form of animation, in which the motor replaces the projector. His sculpture again raises questions about mixing the analogue with the digital.

Introduction

The 'direct' animation films of Len Lye (1901–80) are hand-made and based on the use of celluloid. Today, however, such films are only available in digital form, with the rare exception of archival screenings. This migration from pre-digital, celluloid film technology is worth discussing, not as an argument about which is better, but to highlight differences between the media and the problems involved in digitizing this animator's work.

This is not merely a technical or stylistic matter since it highlights Lye's basic aesthetic. As an original theorist of movement perception, he created art that was body-based to an exceptional degree. Related to that was his concept of animation as 'a vicarious form of dance' (Lye 1984). His advocacy of strong kinaesthetic and proprioceptive elements in art, and in the viewing of art, still has relevance for some of the digital work being done today.

Hand-made animation

What gave his animation such a deeply physical character? He started out with cel animation (in the 1929 film *Tusalava*) and stop-motion animation (in the 1933 puppet film *Experimental Animation* or *Peanut Vendor*). But then in 1935, at a time when he was too poor to afford a camera and film stock, he became the pioneer of 'direct' filmmaking by applying lacquer paint directly to celluloid. He was able to scrounge strips of clear leader from film companies and to paint and scratch 'figures of motion' (as he called them), informed by the abstract drawings and paintings he had been making for more than a decade. His work also reflected his interest in the 'doodling' style of Surrealist painters such as Joan Miró, and in the kinds of pattern painted and stenciled on *tapa* cloth which he had gone to Samoa to learn. He synchronized the images in a free spirit to Cuban dance music.

There had been previous attempts to paint by hand on celluloid, but animators had found it difficult to draw directly on a tiny film frame, and they were disconcerted by the unsteady movement. But Lye realized that the vibration or jitter actually suited the resonance of the jazz-like music he was using. It could give his abstract images a greater physical, kinetic energy. Artists speak of a 'boiling line' but Lye preferred to describe it as 'a quality of zizz'. He saw direct film as a deliberate alternative to the neat outlines of Walt Disney's animation drawings. His hand was remarkably controlled but his brush strokes and scratches became complex gestural shapes once the 35mm by 24mm frame was blown up to the size of a cinema screen (which was then typically about 16 m wide and 12 m high).

In the next few years, Lye made a series of such films, including *A Colour Box* (1935), *Kaleidoscope* (1935), *Colour Flight* (1938) and *Swinging the Lambeth Walk* (1939). To preserve the master copy, he would make a negative and prints, but he worked hard to retain the power of the original, the physical energy of the hand-painting and the intensity of the colour. Colour film was still new in 1935

and the results of live-action filming had often been erratic. In by-passing the camera, Lye was able to achieve more brilliant colours, and his work created great public interest. A newspaper reviewer said: 'You've not seen a colour film till you've seen a Len Lye effort'. In general, his audiences would divide between those who objected to abstract art and those who loved the energy of the films and wished they could get up to dance. Because of the hubbub of both cheering and booing at cinema screenings, Lye's work attracted much newspaper coverage and he gained celebrity. A screening of *A Colour Box* at the 1936 Venice Film Festival ended in a riot when a group of Fascists tried to close it down because they saw it as 'degenerate art' (Horrocks 2001).

Digital technology has of course made it an easier, safer and less physical process to create images. Granted, some aspects of physicality persist such as the editor's fingers flying over the keyboard. The literal meaning of the word 'digital' is 'of the fingers', though it also has a mathematical meaning in referring to our base-10 number system. (The invention of base-10 is lost in antiquity, but it must have had its origin in our number of fingers.) We need to remember that making a process easier can blunt certain types of awareness. Any pre-digital filmmaker remembers the physicality of working with celluloid film. A filmmaker had to attend closely to every detail because of the costly and sensitive nature of film stock in terms of exposure, processing, printing and projection. Editing involved the direct cutting and cementing of celluloid strips. In the 1930s, film was also inflammable. But the most important physical aspect for Lye was the pleasure he took in 'the body English feel' of his images, along with his success in transforming the high-tech medium of film into something hand-made. Steve Jones, a later assistant, remembered Lye teaching him to scratch lines in a freer style: 'You can tell when they [the lines] have a real elasticity to them, a movement that's more like muscle' (Horrocks 2001).

One of Lye's favourite motifs was one or more vertical lines drawn vertically down the film strip, which he would synchronize with a range of instruments. He learned to do many things with a line such as making it sway, vibrate, wriggle, jump or glide. With sequences of guitar playing by Django Reinhardt, *Swinging the Lambeth Walk* was a showcase for this kind of kinetic effect.

Lines of thought

Maurice Merleau-Ponty's phenomenology offers a useful context for discussing Lye's work because of its emphasis on embodiment. Merleau-Ponty's last published article, 'Eye and Mind', looks at the ways in which a work of art can imply an embodied philosophy. He writes: 'every theory of painting is a metaphysics'. This occurred 'not when he [the artist] expresses opinions about the world but in that instant when his vision becomes gesture, when, in Cézanne's words, he "thinks in painting"' (Merleau-Ponty 1964). Also relevant to Lye was Merleau-Ponty's close look at experiments with lines: 'It is simply a matter of freeing the line, of revivifying its constituting power…. Perhaps no one

Figure 1: A Colour Box *(frame enlargement), 1935. Stills collection: Ngā Taonga Sound & Vision. Courtesy the Len Lye Foundation and the British Postal Museum and Archive.*

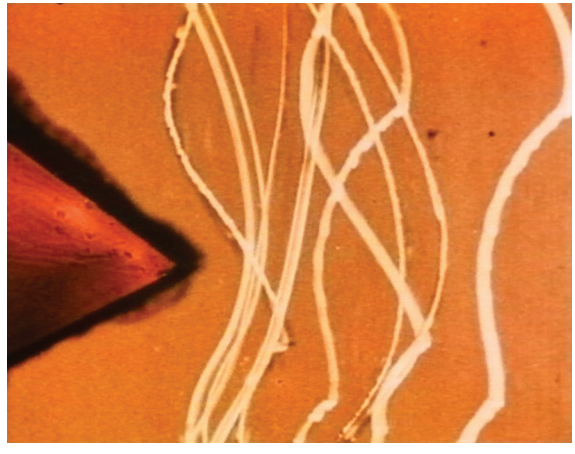

Figure 2: Swinging the Lambeth Walk *(frame enlargement), 1939. Courtesy the Len Lye Foundation.*

before [Paul] Klee had "let a line muse"'. And: 'every […] inflection will have a diacritical value, […] will form an adventure, a history, a meaning of the line – all this according as it slants more or less, more or less rapidly, more or less subtly' (Merleau-Ponty 1964).

Lye kept developing camera-less film in new ways throughout his career. Arguably his most important film was *Free Radicals* (1958) in which he deliberately reduced the medium to its most basic elements – light in darkness. He took strips of black leader and engraved his images with a series of scribers which included needles, dental tools, and an old Native American arrow-head. When projected, the lines, dots and streaks that he inscribed on the black film had an electric energy, like flashes of lightning in the night sky. His scratches needed to go deep into the emulsion but not tear the celluloid. His hand would do a sequence of about 24 frames on each pass. Filmmaker Hilary Harris who watched Lye on the job recalls that

> He had developed a kinetic use of his hands. It reminded me of when I was editing film, I'd get into a similar rhythm of work. But his hands had developed such a keen rhythm there was a real coherence in the way things progressed from frame to frame. His films are outstanding in terms of kinetic integrity and what I call aliveness.
>
> (Horrocks 2009)

Informed by a life-time of practice, Lye's lines were unmistakably hand-made, indexical signs, vibrating in a very physical manner. For example, there is a sequence in *Free Radicals* where lines run together from different directions to create an asterisk shape. This is an asterisk in process, in constant movement. It struggles to remain intact, being tugged energetically around the screen as the individual lines persist in pushing and pulling. This was one example of 'a figure of motion', the animation equivalent of a musical idea. Lye was a perfectionist who would create many versions of each figure until he felt he had made it 'wiggle in a way that is fascinating' (Weinberg 1963).

Free Radicals won second prize in a world-wide competition for experimental films at the 1958 World's Fair, judged by Man Ray, John Grierson, Norman McLaren, and other well-known film-makers. In a discussion of abstract films, Jonas Mekas drew a useful contrast between Lye's approach and that of artists with a more intellectual orientation: 'Free Radicals, though highly formal and pure, is charged with emotion. The drawings and scratches have a spontaneous quality of powerful impact upon the viewer' (Mekas 1959). Despite the prestige of the award, Lye later decided that the film still contained some imprecise moments, and he ruthlessly edited it down from five to four minutes. Stan Brakhage praised the end result as 'an almost unbelievably immense masterpiece (a brief epic)', and the film was selected by the US Library of Congress as a 'classic film' to 'preserve for all time' (Library of Congress 2008; Horrocks 2009).

Dancing hands and dancing images

It is customary for animators to have a highly developed sense of rhythm and physical movement. What was unusual about Lye's work was the degree to which its impact was heightened by its hand-made qualities, the boiling (or 'zizzy') lines, the sense of tension and vibration, and the emphasis on dance. The style of gestural abstraction in his 1930s films can be seen as a precursor of abstract expressionism. In 1944 he moved to the United States and got to know the New York School of artists who started to develop their painterly style at the end of the '40s (Curnow 2014; Selz 2017). Lye's films were screened at some of their gatherings.

The New York artists emphasized the power of physical gesture, and their so-called action painting involved the body. Dance theorist Roger Copeland has described the actions of Jackson Pollock – as recorded in Hans Namuth's famous 1950 film of the painter at work – as a demonstration 'that the fundamental impulse behind abstract expressionism was *the desire to transform painting into dancing*' (Copeland 1983, original emphasis). He links this with Pollock's interest in 'primitive art' and the 'ecstatic dancing' thought to have been associated with it. Whether or not this is an adequate description of the painter's work, it certainly suits Lye's working methods, particularly his later films for which the very process of scratching images became a kind of dance. Steve Jones has described the way Lye taught him to work: 'It's like learning to dance…. To scratch film you have to let go of your inhibitions and let your body move' (Horrocks 2001). It is possible to see *Free Radicals* as the most important film to have emerged from Abstract Expressionism.

Lye applied his emphasis on physicality to the training of artists, teaching 'sense exercises' to his students at New York University to 'ensure that the body got together with the brain at crucial moments' (Horrocks 2001). He also constantly stressed the need to develop 'bodily empathy' for the viewing of films, in the kinaesthetic way that we respond to a gymnast or a dancer or a kinetic sculpture. In 'Proprioception as an Aesthetic Sense', Barbara Montero comments that 'a trained dancer often trusts proprioception *more* than vision when it comes to evaluating aesthetic qualities of his or her movements and positions'. And while 'much of the proprioceptive information we receive about the movements of others, and even of ourselves, is below the level of conscious awareness', a young artist can set out deliberately, as Lye did, to develop that kind of sensitivity (Montero 2006). Had Lye still been alive in the 1990s he would have been fascinated by the discovery of mirror neurons which appear to provide a neuroscientific basis for empathy and the intense human response to movement.

In choosing soundtracks for his films, Lye turned to jazz and ethnographic music associated with dance (on labels such as Folkways). For *Free Radicals*, he selected a powerful, rhythmic piece of African drum music in which the drummers' hand-slaps had a strong human presence, quite unlike a drum machine. Lye was himself well-known for his quirky, syncopated style of dancing at parties and jazz clubs.

Artist Ray Thorburn remembers him citing the lines he drew for the guitar and bass passages in *Swinging the Lambeth Walk* as 'one of his best interpretations of jazz music' (Thorburn 1978). In a letter, Lye described the thumping line which accompanied the bass solo as 'a spiffing sequence of twangs […] yes! I mean Hoorroo, Hoooooroooo, Hooooooooo'. Perhaps this sequence was also the music on his mind when he wrote in a 1940 Surrealist magazine: 'Everything is XXXX cellent and the hum on the double-bass is so extreme that one's cord quivers in sympathetic response or should we say ecstatic response' (Lye 1940). The image of a vibrating 'cord' was a vivid way for Lye to explain what he meant by physical empathy in a viewer's response to the kinetic qualities of art.

In theorizing his call for a kinaesthetic approach, Lye drew upon the neuroscience of his day such as the conception of the 'triune brain' formulated in the 1960s by Paul MacLean (MacLean 1990). MacLean's account of the 'Old Brain' matched Lye's emphasis on the nervous system and the body's proprioceptive skills. The 'New Brain', the zone most recently added by evolution, was the cerebral cortex. Lye valued that area as essential for tasks such as theorizing, but he was suspicious of any form of art or criticism which became excessively intellectual. He was critical of certain types of early computer art and Constructivist kinetic sculpture which seemed to him to be merely showing off technically.

Digitizing Lye's films

When unauthorized examples of his films have been posted on YouTube, they have had the advantage of stirring up new interest among young people, but Lye would have been shocked by the quality of the copies. Since the millennium, digitizing has been necessary to keep the films in circulation, but it is a huge challenge to transfer them adequately, especially *Free Radicals* and *Particles in Space*. How to capture the texture of these ultimate examples of hand-made, analogue animation? The work has been supervised by Sarah Davy and others at Ngā Taonga Sound & Vision, New Zealand's film archive, but they have enlisted the help of Peter Jackson's Park Road Post with its state-of-the-art technology. Even very-high-resolution copies need careful monitoring and selection.

Lye made his films for the so-called black box of the cinema, a venue with blackout and sound insulation. That context ensured that the audience gave a film their full attention and most would watch it from beginning to end. Since television sets entered the home, viewing has become a more casual business. Today, art institutions tend to screen Lye's films in the so-called white cube of the gallery space. Digital wall screens are a marvellous technology with many uses, but they are not always a happy medium for films. Putting on headphones and watching a film on a small computer screen, or strolling past a film projected on the wall in a floodlit gallery is a very different experience from sitting in a darkened cinema dominated by a large screen. Ambient light is a special problem for black-and-white films with crisp images such as *Free Radicals.*

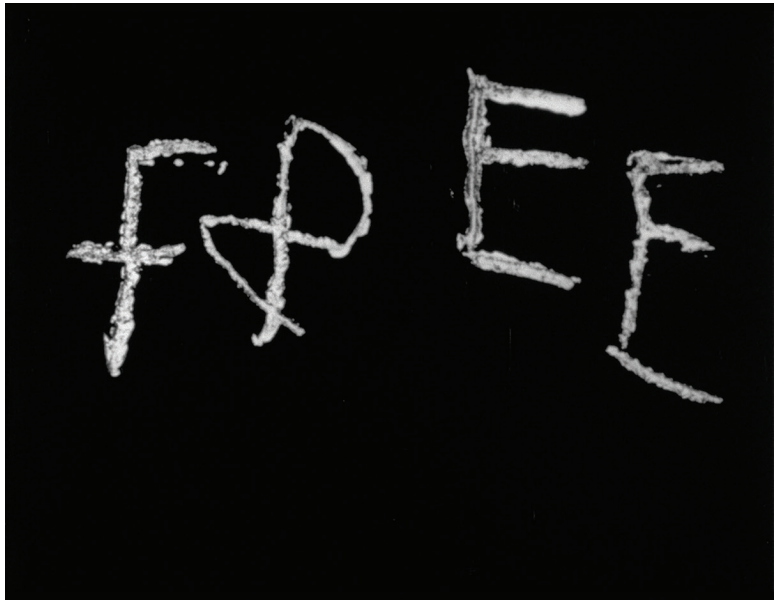

Figure 3: Free Radicals *(frame enlargement), 1958, revised 1979. Part of the hand-drawn title sequence. Courtesy the Len Lye Foundation.*

Lye's sculpture

Lye was an important kinetic sculptor as well as a filmmaker. His sculpture can be seen as a form of animation, a choreography of abstract shapes like his films, in which the projector has been replaced by a motor. Was this a shift to three dimensions? First, it is important to note that Lye's animated films did not offer an illusion of 3D (as Walt Disney's did), but created what might be called modernist space. Modernist artists sought to jettison linear perspective with its machinery of vanishing-point, foreshortening and horizon lines, and to replace it with dynamic versions of shallow space in which forms overlap in ambiguous ways. Often the shapes seem to reach out towards the viewer instead of receding away.

Figure 4: Len Lye's Sculpture Zebra. *Len Lye Foundation Collection, Govett-Brewster Art Gallery. Photo by Sam Hartnett.*

This was the approach taken by a range of avant-garde painters and animators, but it was not often associated with sculptors who worked in metal. Lye's sculptures are very striking in the way they create a complex, fluid space. They hold little interest as static objects, and the viewer must wait until they are activated in order to produce complex 'figures of motion'. Lye's emphasis on the body is as strong for his sculptures as for his films. The metal parts vibrate and spin, dancing to music of their own making, or in some cases to recorded music. One of Lye's methods of introducing a sense of physical tension was to use a motor that was only just strong enough to do the necessary work. The strain on the metal produced what Lye called 'that tingling business'. Some of the sculptures have even been described as sexy, with critics drawing comparisons with a belly dance or the experience of sexual tension rising to a climax.

It is remarkable for mechanized, metal sculptures to produce such strong feelings of physical empathy. When school parties come to a Lye exhibition, it is a pleasure to see some of the very young children start dancing spontaneously in response to the movement. Just as Lye's films differed from those of his contemporaries, such as the German abstract film-makers who favoured more symmetrical forms and classical music, so his sculptures differed from the many kinetic sculptures associated with the Constructivist or Bauhaus traditions. Lye's work was more organic, less architectural or geometric.

His sculptures were similar to his films in terms of their sense of space, as an increase in speed would cause objects to de-materialize or blur together, and a spinning, striped rod would produce curious effects of 'virtual volume'. The sculptures also had a hand-made quality since they would grow out of a process of 'messing-around-doodling' with pieces of metal. This involved a 'long quest for a kinetic material of the best alloy for oscillation without metal fatigue and for visual effect of sway, spin, feedback energy, vibration' (Wall 2018). Lye always wanted to keep enlarging the size of his sculptures, which reflected his years of experience in blowing up frames of film to the size of a giant screen. Many of his sculptures were best viewed front-on, as in a cinema, and they tended to proceed through a four or five minute programme, the typical length of his films. He was always disappointed when viewers of a sculpture did not stay for the whole of the sequence since he had given it a definite start, middle and end.

Because the vibration introduces an element of randomness, each performance of the sculpture is slightly different, like a live dancer who repeats the same choreography, or a music group re-playing the same score. At the same time, Lye became frustrated because the sculpture often broke down, and he wanted to create more complex programmes. He knew that computers were evolving rapidly and he saw them as a way to realize some of his artistic aims more fully. Galleries and museums were asking for more consistent forms of control since they were afraid the sculptures might

misbehave and injure viewers, and they were worried about the need for repairs. For those reasons, Lye began to incorporate digital programming, but his death in 1980 cut his experiments short.

The Len Lye Foundation had been created by the artist to future-proof his work and to improve the technology. Since then, digital programming has created safer and more consistent performance. The problem has been how, in a digital environment, to retain a dash of randomness. Evan Webb, the artist who is the Director of the Foundation, has been working on that challenge. The material parts of the sculptures still have analogue properties. For example, when preparing to cut an upright metal strip to make his sculpture Blade, Lye would not proceed by formula but would raise the strip vertically to see where it started to bend. What he wanted was not perfection but a sense of the flow and gradual change inherent in physical nature, as we see in the human body. An element of change can be incorporated in programming, just as there are algorithms to add the look of film grain to digital moving images, but such programming is always a complex business, involving much trial and error.

Lye's work is now a hybrid of the hand-made and the digital. But then so is much of today's animation. As I said earlier, I am trying not to argue that one is better than the other, but seeking to explore their differences – the continuous sine wave versus the discrete square wave. I am sure that Lye would have been excited by today's digital animation, as practiced by local artists such as Greg Bennett, Hye Rim Lee, Lisa Reihana, and Miriam Harris, and he would have been eager to experiment with the new technology – but no doubt he would have found quirky, original ways to do so. He would have wanted always to retain a kinaesthetic or proprioceptive aspect, making art in which 'the body got together with the brain'. Or as expressed by Duke Ellington (whose music Lye used in one of his films): 'It don't mean a thing if it ain't got that swing'.

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Festival. Along with his wife Shirley Horrocks, he has for many years been a director of the film company Point of View Productions.

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