Visual Music

by Maura McDonnell, 2007

A visual music piece uses a visual art medium in a way that is more analogous to that of music composition or performance. Visual elements (via craft, artistic intention, mechanical means or software) are composed and presented with aesthetic strategies and procedures similar to those employed in the composing or performance of music. This essay provides an overview of some of the key aesthetic strategies for using music constructs and music composition used by artists, filmmakers and instrument builders from the absolute and abstract film and art traditions and the color organ traditions.

The Visual Music Artist

Today, technology provides the opportunity to create and mold parameters of image and sound in imagined and unimagined ways. A new type of hybrid artist who works across media and technologies is emerging. Walter Ruttmann foresaw this in 1919 when he remarked that technological progress would lead to the acceleration of the transfer of information between sound and image, leading to a "constant state of being swamped with material" and thereby to an altered state of perception. As a result of this, a "new, hitherto latent type of artist would emerge, approximately half-way between painting and music."[1] This is very much the case today: musicians and music composers can craft visual music compositions either with or for music, and artists and filmmakers can craft original music and soundtracks for their visual compositions.

The computer in particular has become an instrument for forging music and image connections. John Whitney Sr., whose work with filmmaking across three broad domains (optical to analog to digital), states, "Technical innovation is thus providing the means to begin a fine art for eye and ear." He adds, the "computer [is] the only instrumentality for creating music inter-related with active color and graphic design, and though the language of complementarity is still under-examined and experimental, it foretells enormous consequences and offers great promise."[2] The visual music practice of today is diverse and wide-ranging, assisted by computer and digital technology tools.[3]

Visual Music Composition

Visual Characteristics and Musical Characteristics

What are the visual characteristics available to the visual music artist that are akin to the musical characteristics available to the music composer? How are they used? There are the broad strokes and consideration of, for example, music tradition, style, time, structure, form, space, rhythm, duration, relations, harmony and gestalt. Then there are the more specific strokes of, for example, orchestration, phrasing, line, color, contrast, shape, pattern, repetition, consonance, dissonance, tone and dynamics. Added to this are the artistic style and intentions of the composer, where there is a consideration for the expression of concepts, ideas and emotions. The result is a temporal visual artwork that exists in time and whose constituent elements evolve over time just as music elements evolve and exist over time. Some broad categories from which to examine visual music compositions are aspects of the language, grammar and syntax of music composition that are used in a similar manner, are shared in the visual domain or both. Artists, filmmakers, technicians, instrument builders and system designers seek their own connections between music and sound and use these parameters and characteristics of sound in different ways.

This section of the essay draws a path through historical works that connect images and sound with a view to bringing forward some of these connections. Notwithstanding the difference between the visual and sound mediums, the common ground with music in visual music work is a consideration for composition; it is in the composing part—the craft of creation—that has resemblances to music composition. Each visual music artist has an idea and approach to working with his or her chosen visual material. The visual material is pliable and formless; it can be taken from many sources, just as contemporary music takes its sound material from many sources and shapes it in many different ways. What is most striking about visual music works, however, is that in order to put some shape onto this visual material, the focus has been on using concepts from music, focusing on the structures and language, yet reworking these concepts for a visual

production. One of the common properties between music and moving image is the property of motion. All the artists and works discussed here consider motion in their work; at some level, the essence of visual music composition is this composition of motion.

Is it the case that a new grammar for a new art form, which the early pioneers of music and visual art, particularly those who worked with film had envisioned and sought in their works, is being created and continues today?

Painting According to a Language of Music
The forms and language of music composition have been used by some painters, often in a metaphorical manner. They are also a source for creating a visual language that helps the artist construct images that focus on creating visual forms and translating concepts and structures of music into concepts and structures of the visual. The resulting imagery is often non-narrative, non-representational and abstract, bringing imagery into a similar position as music. The non-representational nature of music and its emotional expression is mirrored in the non-representational nature of the resulting imagery that also expresses and appeals to emotions. By exploring the visual with musical thinking, artists create new visual forms, new patterns and new relationships between visual elements. Abstract painters such as Wassily Kandinsky (1866–1944), Paul Klee (1879–1940) and Roy De Maistre (1894–1968) worked with music concepts and ideas, translating them into their own ideas and principles for artistic practice.

Roy De Maistre, a musician turned painter, devised a system of color-music codes based on Sir Isaac Newton's theories of color and the correlation of colors to the seven pitches of the musical scale. The underlying assumption in his color-music codes was that "a mathematical relationship of frequencies […] united the physical phenomenon of light and sound." [4] De Maistre devised his color charts and aligned them to the white notes of the keyboard starting with the note A for the color red, and from this he created his color-music code of pitch correspondence to different hues. He used this color code and his pictorial composition aesthetic to compose his paintings. This can be seen in his painting

Rhythmic Composition in Yellow Green Minor (1919). Interestingly, his later work focuses more on a chord-based, rather than a note-based color-music code.

Kandinsky was interested in the analogous relationship between music and painting. He recognized that there was an emotional appeal in abstract art as in music. His artwork imagery is like a counterpoint in music where there is interplay of form, color and expression. He had a structural method of composition.[5] Judith Zilczer quotes Kandinsky from his book *On the Spiritual in Art*: "Color, which itself affords material for counterpoint, and which conceals endless possibilities within itself, will give rise, in combination with drawing, to that great pictorial counterpoint, by means of which painting also will attain the level of composition and thus place itself in the service of the divine, as a totally pure art."[6] Kandinsky was influenced by the atonal music of composer Arnold Schoenberg and found the dissonance in atonal music to be comparable to the freedom and creative energy in his abstract painting.

Paul Klee's paintings, whose titles often refer to musical terms, used music as a framework with which to explore his artistic ideas. Unlike Kandinsky, Klee was interested in the traditional harmony and counterpoint of 18th-century music composition. The classical music period developed disciplines and rules of composition across a range of forms and structures. Klee's interest in working with music structure was an important part of his painting composition. He used color to create harmony in his work, eventually focusing on working with the musical analogy of polyphony and counterpoint in his painting, transforming the formal elements of musical polyphony into an equivalent form of visual polyphony for his paintings. He was interested also in formulating a vocabulary of abstract art comparable to the rules and structures of music composition. One of his visual polyphonic methods was to overlay colors and intermingle shapes and forms to suggest polyphonic forms and create a rhythm and direction with pictorial elements.

Principles of Counterpoint—Orchestration of Form
Viking Eggeling and Hans Richter researched and experimented with the aesthetics of the visual and explored through their art new principles, technical devices and techniques to

create non-representational works. One of their ideas was to explore the many visual forms of relationships that used the principle of the "equivalence of opposites"[7]; they approached this idea with the principle of musical counterpoint. This led to a number of drawings of "themes" or "instruments" consisting of the transformation of the contrasting relations of visual elements, which were orchestrated through different stages, bringing about a dynamic arrangement that they felt as being "the music of the orchestrated form." This can be illustrated in Richter's first scroll painting *Prelude* (1919), described as the orchestration of a theme developed in eleven drawings, which demonstrates such oppositions among the visual elements where "a vertical line was accentuated by a horizontal, a strong line connected with a weak one, a single line gained importance from many lines, etc."[8]

Eggeling and Richter made the unexpected discovery that elaborating the transformation of the visual relationships across the large elongated horizontal painting of the scroll forces a type of rhythmic expression into the painting which, in turn, creates a form of dynamic expression that produces a sensation for the eye as it transverses and memorizes the sequence of visual elements across the scroll.

Orchestration of Movement

Eggeling and Richter realized that the kind of accumulated energy that took place in the orchestration of the visual forms across the scroll needed to be released into actual movement: "Movement implied film."[9] Film was a new medium for them, yet each took the ideas and principles that he had used in his scroll paintings and worked with the constraints and potential of this new moving art medium. Eggeling continued to work with the orchestration of form and applied motion to the forms that he had developed for his scroll paintings. His visual forms for film were comparable to music instruments that now had their own defined ways of being articulated through different stages, with motion, over time.

This availability of time and continuity through the medium of film brought to full realization the release of the movement that had accumulated in the scrolls. Eggeling's

forms still retained what Richter calls their "graphic elegance." In his film *Symphonie Diagnonale* (1924, first publicly shown in May 1925 at the Absolute Film Show in Germany), the graphical lines and shapes that appear and disappear, evolve and transform over time were created using paper cutouts and tin foil figures that were photographed one frame at a time. *Symphonie Diagnonale* has a tremendous musical feel to it, in its use of rhythm, motifs, themes and forms. The film has no soundtrack, but it has the most evocative musical quality to it. The animation of the visual elements of line, figure and shape brought about rhythmic sequences and a sense of dynamics in the progression of these rhythmic figures. Visual "instruments" could now evolve, transform and progress in visual rhythmic sequences.

These parameters of "instruments," rhythm, dynamics, figures and shape are analogous to the parameters of rhythm, pitch, phrasing and timbre available to music composition. In abstract animation, the now hard-to-define artist could compose his or her animations like musical compositions, orchestrating the visual elements, creating motifs and repetitive elements, transforming a visual element's shape over time, and creating a sense of harmony and symmetry in the use of screen space and screen time. All the non-representational strategies for composing music were now available to the abstract filmmaker.

Orchestration of Time

Richter realized that time was the basis of this new art form. Continuing from his ideas about counterpoint and the equivalence of opposites, Richter moved his focus from orchestrating form to orchestrating time relationships. "The simple square of the movie screen could easily be divided and 'orchestrated.' These divisions or parts could then be orchestrated in time by accepting the rectangle of the 'movie-canvas' as the form element. Thus it became possible to relate (in contrast-analogy) the various movements on this 'movie-canvas' to each other—in a formal as well as a temporal sense."[10]

Richter's first abstract film, *Rhythmus 21* (1921),[11] is an excellent example of his ideas about time relationships. The screen being the form of the image is most interesting. The

visual forms that are created for the screen exhibit two main properties: the static visual composition of each frame of the screen and the temporal composition of both the screen image and the visual forms in the screen image over time.

Expressive Moving Paintings and the Composed Score

Walter Ruttmann's *Lichtspiel Opus I* premiered in Germany in 1921, the first abstract film to be publicly screened. In the film, Ruttmann mastered the technical means to realize his abstract imagery in film. He patented his particular technical methods in 1921. Dr. William Moritz provides an interesting description of his method: "[Ruttmann's] first animations for *Opus No. 1* were painted with oil paints on glass plates beneath an animation camera, shooting a frame after each brush stroke or each alteration because the wet paint could be wiped away or modified quite easily. He later combined this with geometric cut-outs on a separate layer of glass."[12]

Ruttmann's visual style is considered to be more expressive than Eggeling and Richter's and overall has a painterly feel to it both in technique and in the use of screen, color and movement. Indeed, his technical methods are also painterly and would have had a definite bearing on the resulting imagery. His Opus films have been described as paintings that move in time. While Richter and Eggeling focus on figures, forms and time relationships between visual elements, Ruttmann focuses on a more expressive visual aesthetic for his imagery. He exploits "movement and color to create choreographies, where entrances and exits, collisions and complementary trajectories establish a linear, cumulative scenario or development in which new configurations, colors and shapes appear right up to the last moments of the film."[13] And he uses color as an element in the choreography that helps not only to structure the film and "differentiate certain shapes, movements or repetitions, but [also] sometimes to establish general mood or atmosphere."[14]

Ruttmann also envisioned his *Lichtspiel Opus I* film to be closely related to music and commissioned the composer Max Butting to compose a string quartet for it. In the music score, Ruttmann provided many indicators for the musicians to ensure that the music

precisely synchronized with the visual elements of the film.

Color Sings—Colored Rhythm

Léopold Survage (1879–1968) connected his ideas about color with music and foresaw the potential of film to bring forth his ideas about color—color and rhythm in particular. Because sound is the primary element of music and color is the primary element of painting, he believed that when rhythm by means of movement is applied to color, the resulting colored rhythm becomes an abstract form that is superior to the use of color in static painting and is more like music. Color sings because it is in rhythmic motion; the principle of mobility brings forth the rhythmic motion.[15] The alternating series of color that occurs when color and rhythm is realized with motion can exert a psychological influence on us similar to the way the alternating series of sound in music exerts a psychological influence.

Survage conceived that rhythm existed independently of color, but that through the mobile animation of color, rhythm could be captured and aesthetically harnessed and a colored rhythm would result.[16] He conceived that the film medium could be the means for providing the mobile animation of this colored rhythm. Survage prepared a series of drawings, his *Colored Rhythm: Study for the Film* (1913), for the purposes of having them realized in film. Unfortunately, not being able to secure the funding or a patent for it, Survage never made the film. Nevertheless, the individual pictures for this film and the idea of using film or cinema to realize the movement of these stills were in place by 1913.

Similar to Richter and Eggeling, Survage recognized that time was the necessary component to bring forth, in particular, the dynamics of rhythm and movement of visual elements. His intended film *Rhythme Colore* and his series of drawings for the film didn't simply illustrate or interpret music; rather, he believed them to be an autonomous art, based upon the same psychological premise of music. It is the "mode of succession of their elements in time which establishes the analogy between music, sound rhythm, and that colored rhythm of which I am announcing the realization by means of cinema."[17] His color was an essential part of his pure abstract image aesthetic.

Composing Motion—Figures of Motion

Eggeling, Richter, Ruttmann and Survage all came to the realization that motion was needed to fully realize their visual esthetics. Their works and ideas crossed the "glistening bridge" from still to moving art, as Survage had foreseen in the medium of film.[18] Len Lye (1901–1980), a kinetic artist and filmmaker, was interested in the kinetic potential of visual forms for film, which he perceived to be like music. He worked with the techniques of direct film and color processes to create films that enhanced the kinetic and motion potential of imagery. He identified his visual forms, which were often set to jazz-calypso music, as being like figures of motion. Composing visuals set to music was a task in composing motion, a task similar to that of the music composer who composes music.

Len Lye discovered the potential of composing with motion. "If there was such a thing as composing music, there could be such a thing as composing motion. After all, there are melodic figures, why can't there be figures of motion?"[19] His film *A Colour Box* (1935) is the first film in which he painted and scratched directly onto the filmstrip, creating a visual mass of complex and jumbled movements. As one commentator notes: "This creates a sense of off-screen space, as if the patterns are streaming in and out of the frame. Also, the dynamic abstract shapes seem to dance to the popular Cuban music that was used as a soundtrack. Lye used the soundtrack as a creative base by associating particular shapes with certain sounds, so that there is a loose relationship between sound and image."[20]

Music and Image Synchronization—Acoustical Laws and Optical Expression

Oskar Fischinger (1900–1967) saw the first performance of Walter Ruttmann's *Lichtspiel Opus 1* in 1921 and as a result was inspired to work with the absolute cinema of abstract filmmaking and synchronized music.[21] Music was used in his films to make the absolute nature of the visuals more understandable. As William Moritz explains, "In the spirit of non-objective art, he [Fischinger] maintained, correctly, that his films were absolute experiences in and of themselves, not representations of some other object or

experience."[22] However, even when the music would suggest a flow or structure for his film, his visual compositions were composed carefully to "represent visual structures and dialogue with some sort of meaningful conclusion."[23] For example, in his Studies series of films, started in 1929, he explores in each film a specific visual task. In *Studie No. 9*, for example, he explored streaking afterimages, which were also explored in several other Studies films. [24]

Music adds another dimension to Fischinger's films, where the tightly synchronized non-representational graphics and music appeal directly to the feelings of the viewer. *"The flood of feeling* created through music intensified the feeling and effectiveness of this graphic cinematic expression, and helped to make understandable the absolute film. Under the guidance of music, which was already highly developed, there came the speedy discovery of new laws—the application of acoustical laws to optical expression was possible. As in the dance, new motions and rhythms sprang out of the music, and the rhythms became more and more important."[25] By focusing on the rhythm and dynamics of the music to enhance the experience of the abstract elements, the visuals and the music at times seem to fuse. The rhythm and the dynamics in each medium have a togetherness and unity.

Fischinger selected music from classical and jazz traditions for his music and image films. Some of the music tracks were chosen by his patron, Baroness Rebay. For example, Rebay commissioned Fischinger to create a film using Bach's *Bradenburg Concerto No. 3*, which resulted in Motion *Painting no. 1* (1947).

Fischinger was an innovative and versatile filmmaker and inventor. In his work, he straddles several visual music traditions and filmmaking techniques, even inventing his own devices to realize his ideas. He invented the Lumigraph, a device to perform color, and a wax-slicing machine, which he used to create a temporal transformation of both soft and hard geometric imagery for his films. (He also built one for Walter Ruttmann.)[26] He created synthetic sound by modifying a camera that was able to photograph his ornament drawings and other geometric shapes right onto the film's soundtrack. His *Ornament*

Sound (1931) was able to turn his visual shapes into actual sounds.[27]

Synthesis—Simultaneous Composition of Sound and Image

The Whitney brothers, John Whitney Sr. (1917–1995) and James Whitney (1921–1982), sought to bridge the gap between animation and sound and their actual realization.[28] They were interested in the combination of graphic arts and music and in building devices to realize the synthesis of music and image. An important part of their method was to meticulously plan, compose and score their films and investigate the "complementarity" of music with filmmaking. However, in order to do this, they departed from looking at the cinematic potential and focused more on methods to create a more simultaneous composition of sound and image and a more immediate rendition of the temporal dimension of sound and image. They also strove to create a more instantaneous harmonic union of abstract art and music. [29]

The Whitneys were influenced by the music of Schoenberg and in particular Schoenberg's twelve-tone system of music composition, for example in composing the films *Catalog* and *Arabesque*. In 1975, John Whitney Sr. invited the contemporary visual music computer animator Larry Cuba to be the programmer on *Arabesque*.[30] Like Schoenberg reducing music to the serial row, the Whitney brothers reduced the image "down to its most fundamental state—essentially a point of light, which could then be ordered like a tone row." [31]

While working out the ideas for his visual-music artworks, John Whitney Sr. simultaneously created the equipment, at first optical, then analog and later digital (the computer), to implement them in both his and some of James Whitney's films.[32] For example, he developed one device that consisted of an optical printer and another that used a system of pendulums to photograph and control the light to expose areas of the soundtrack. This allowed him to create sounds directly on the soundtrack section of the film, "translating oscillations into synthetic sounds of various frequencies and timbres," and enabled him and his brother "to compose sound and image simultaneously."[33] The devices were used to create the early films *Five Film Exercises* (1943–1994) by John and

James Whitney.

In 1958, Whitney Sr. designed his mechanical analog cam machine, which was used to create the visuals effects for *Catalog* (1961). It was also used by James Whitney for his beautiful *Lapis* film (1963–1966). Whitney Sr. soon embraced computer technology and the graphic potential of computer technology, developing computer programs that synchronized computer-generated graphics with music. His Whitney-Reed RDTD (Radius-Differential Theta Differential) composing program was used to generate imagery from sound oscillations. He used his RDTD software to produce his film *Permutations* (1968).

Whitney Sr. made several discoveries about the connections between music and filmmaking. In 1975, he discussed the temporal dimension of art, using the term "computational periodics" while exploring the periodic nature of the visual and sound domains. [34] In 1994, he used the term "complementarity" in terms of the power of computer technology. "A major art form based on a common foundation of harmony is developing that intertwines color with tone in a complementary bond. I call this associative relationship a 'complementarity.' For the first time, one can design and execute visual and musical patterns in an inter-reactive form of temporal union."[35] Another discovery that Whitney made was that action and harmony shaped his audio-visual work. Like other abstract filmmakers, Whitney recognized that his aesthetic and in particular his focus on actions had an impact on emotions. "Fluid, orderly action generates or resolves tensions much in the manner that orderly sequences of resonant tonal harmony have an impact on emotion and feeling..."[36]

Visual Music Performance

Instruments and Systems to Perform Image Parameters

Visual music performances are realized with physical instruments that are played in a manner analogous to a musician playing a music instrument or, increasingly today, with a more systems approach. In the latter, a variety of computer technologies and mechanical

devices (if necessary), both hardware and software, are used to create a mixture of real-time controllers both physical and virtual that drives the live performance of images and sound. Recent contemporary artists such as Golan Levin, Fred Collopy, Robert M. Fuhrer, Roger B. Dannenberg, Sydney Fels, Kazushi Nishimoto, Kenji Mase and Frank J. Malina have developed systems to generate visuals in real time.[37] Toshio Iwai's installation *Piano as Image Media* (1995) provides an interesting interface in which the visual element, light, plays the music element, a piano. However, as in all good music performances, the composition and the artistic strategy are as important as the performance strategy, as are the aesthetic and technical connections sought between music and image parameters.

This section of the essay will provide an overview of some of the color and sound correlations that have been used to create instruments to perform color. It will examine representative examples from the very early color-organ traditions.

The Correlation of Color to Music Tones
The theories of color from the late 18th century and early 19th century influenced the plethora of color organs that were built in the late 19th and early 20th century. It was believed at the time that light and sound were physically similar. Sir Isaac Newton in his *Opticks* (1704) was "the first to observe a correspondence between the proportionate width of the seven prismatic rays and the string lengths required to produce the musical scale D, E, F, G, A, B, C."[38] Newton devised a correspondence of relative widths of the color spectrum to the successive notes of the music scale. His correspondences of color to music tone were: red to C, orange to D, yellow to E, green to F, blue to G, indigo to A and violet to B.
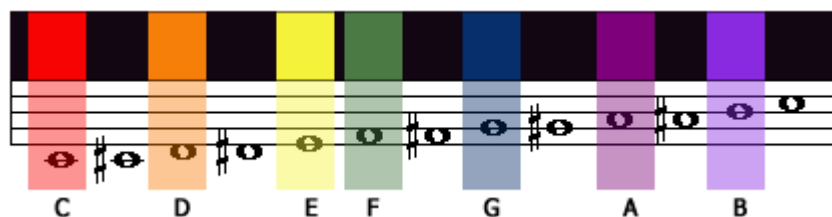

Figure 9. Graph of Newton's color scale.

"Instruments to Perform Color-Music"[39]

The color-to-music tone correlation that was apparent in Newton's correspondences provided the inspiration for a "widespread interest in a viable color-transmission instrument that could be operated from a musical keyboard."[40] Several instrument builders did just that by building keyboard instruments to perform color (with or without sound capabilities) in an analogous manner to the performance of music. Interestingly, color-organ builders devised their own variations of Newton's correspondences by creating their own color-music scales as well as discovering how best to present the colored-light performance. For example, Bainbridge Bishop noted that when he experimented with building a color organ, he found "that a simple color did not give the sensation of a musical tone, but a color softened by gradations into neutral shades or tinted grays did so; also, that combinations of colors softened by gradations into neutral shades or tinted grays, with the edges of the main colors blending together, or nearly together, rendered the sensation of musical chords very well indeed."[41]

Color Music Scale—A Harpsichord for the Eyes

Louis-Bertrand Castel (1688–1757) adapted Newton's correspondence of the relative widths of the color spectrum to the successive tones of the music scale into his own color-music scale. Castel devised a color-music scale: twelve colors to twelve music tones. Newton correlated the color red to the note C. He "considered the fundamental order of the spectrum, i.e. red through violet, to be equivalent to the 'natural' order of tones from C to B. Castel, however, believed that the color blue was analogous to C, and he modified Newton's distribution of the visible spectrum."[42]

The note C was correlated to blue, moving up to the note B, which correlated with indigo.[43] Castel demonstrated his scale by adapting a harpsichord so that "the pressing of the keys would bring out the colours with their combinations and their chords; in one word, with all their harmony, which would correspond exactly to that of any kind of music."[44]

Castel built his harpsichord in 1734 and called it the *Clavecin Oculaire*. This color organ consisted "of a 6-foot square frame above a normal harpsichord; the frame contained 60 small windows each with a different colored-glass pane and a small curtain attached by pullies to one specific key, so that each time that key would be struck, that curtain would lift briefly to show a flash of corresponding color."[45]

Castel was also interested in emulating the experience of participating in a musical performance, an idea that precedes the building of his organ. In 1720 he wrote "Can anyone imagine anything in the arts that would surpass the visible rendering of sound, which would enable the eyes to partake of all the pleasures which music gives to the ears?"[46]
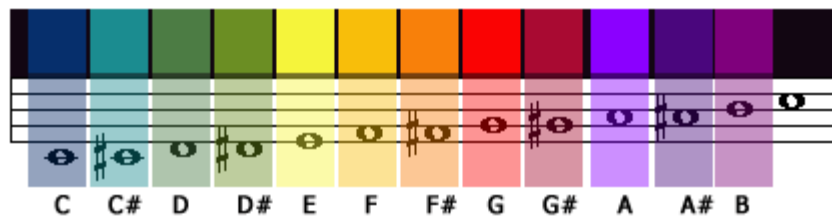

Figure 10. Graph of Castel's color scale.

Painting Music—Harmonious Color

The American inventor Bainbridge Bishop **(dates unknown)** was interested in working with color harmonies. One of his methods of creating harmonic colors was to apply the intervals and harmony of music to the visual domain. However, as he says in his own writing, he also became "dominated with the idea of painting music."[47] Working out a way to create harmonious color in an analogous manner to harmonious music was one of his goals. "The natural harmonic chord of light, as illustrated by the rainbow, shows red as its fundamental or keynote; for this reason I think we should take C, the key-note of the natural scale. It will be observed that its dominant is greenish-blue, its subdominant yellow-green. The greens of nature seem to make up combinations and masses of greens inclining to these two hues. A pure crude green seems to be out of place in a landscape, and, if seen, it generally produces a harsh and discordant effect."[48]

Bishop set himself the task of constructing "an effective and practical mechanism which

would play colors and music together." His color-to-pitch correspondence was based on correlating color to the chromatic musical scale.

After several attempts and experiments, Bishop built a color organ in 1877. An interesting feature of his model was his use of glass to diffuse light.[49] Bishop also provided stops and pedals in his color organ that "could be used by the musician, at will, to aid the expression of the sentiment of the music."[50]
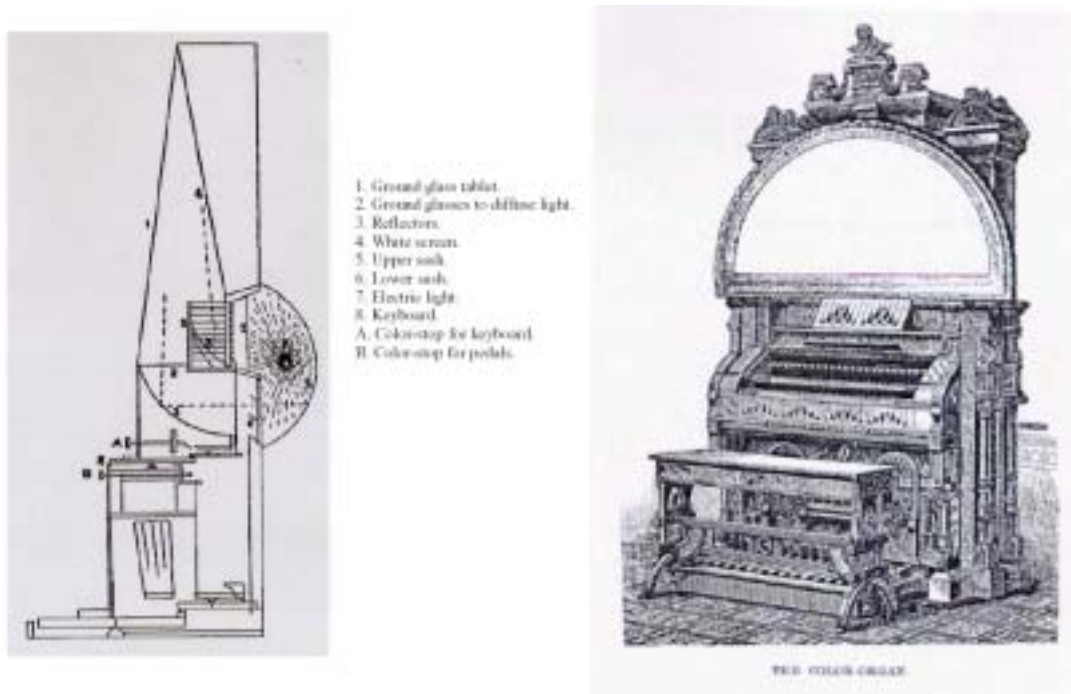

Figure 11. Model and exterior color organ, Bainbridge Bishop, A Souvenir of The Color Organ, with some suggestions in regard to The Soul of The Rainbow and The Harmony of Light, 1893[51]

Mobile Color

Alexander Wallace Rimington (1854–1918) invented a more responsive device to perform color, using electricity to power a system of color filters and arc lamps. It was built in 1893 and was named the *Colour Organ.* As Peacock notes, "this name has become the generic term for all such devices designed to project colored light."[52]

Rimington presented a paper at St. James's Hall on June 6, 1895 about color music[53] and in 1911 wrote a book, *Colour-Music: The Art of Mobile Colour.*[54] He believed that

physical analogies existed between sound and color. His color-music scale was based on dividing the light spectrum into intervals of the same proportions that occur in the musical octave, therefore, "the ratio between two light waves approximated that for a corresponding interval in sound."[55] Each octave then contained the same colors. "The registral placement of colors was directly proportional to saturation, i.e., higher octaves contained more white light,"[56] with saturation becoming the main source of distinguishing the octaves. Rimington's color organ could not simultaneously play color and sound. However, he did recommend it to be played with sound-producing instruments.

Figure 12. Exterior of a Color Organ, Alexander Wallace Rimington, Colour-Music: The Art of Mobile Colour (London, 1912)

Rimington foresaw his color organ as allowing standard musical works to be played and expressed in color. He hoped that composers would in the future write their scores in dual form, composing both a music score and a score for light effects. The composer Alexander Scriabin (1872–1915) included in his score for his music composition *Prometheus, Poem of Fire* (1911) a score for colored light. This was notated at the top of the score. The first performance of *Prometheus* with color realization took place in New York in 1915. The colored-lights part was played on a color-projection device called the *chromola,* a device similar to Rimington's color organ.[57]

Lumia

Rather than focusing on theories of color and sound correlations, Thomas Wilfred (1889–

1968) focused on light alone. He believed the art of light to be a new art form, which he named lumia and in 1922 built an instrument called *Clavilux* to realize his ideas. In addition to pure light manipulation, C*lavilux* allowed for elements of time and rhythm to be articulated in live performance.[58] This is apparent within the controls of the instrument, which consist of keys that are organized into three groups: form keys, color keys and motion keys.[59] "A neutral white beam of light of great strength is intercepted by an arrangement of lenses and built into form through the form keys. The forms, or forms, are made to move rhythmically by means of the motion keys, and either one color or several in any combination are finally introduced from the color keys. The whole instrument is played from a notation book so that any composition can be duplicated exactly, with a margin for personal interpretations by the playing artist."[60]

Wilfred composed for the C*lavilux* and notated his compositions. "A Wilfred Lumia work is a composition of light, color, and form which changes slowly with time. It exhibits a very wide range of light intensity and a broad spectrum of delicate colors and shapes."[61] Between 1924 and 1925 Wilfred played numerous worldwide lumia recitals. In 1930 he founded the Art Institute of Light for research into lumia and his new art form of light.

Color Projection Instruments

Peacock notes that since 1920, many color projection instruments and devices were invented. [62] For example, Adrian Klein's color projector for stage lighting (1920), Achille Ricciardo's *Teatro del Colore*, the composer Alexander Laszlo's *Sonchromatoscope* (1925) and Ludwig Hirschfeld-Mack's *Shadow Plays* (1920–1925). From the 1930s, many artists experimented with interpreting music in colored light. Peacock discusses George Hall's *Musichrome* (1930s), Frederick Bentham's *Light Console*, Christian Sidenius's "*Lumia, Theatre of Light*" concerts and Bulat Galeyev and the use of his color instruments to present huge outdoor spectacles of sound and light. Interestingly, composer Alexander Laszlo commissioned filmmaker Oskar Fischinger to arrange a film projection with Laszlo's later color-light-music concerts. "Oskar edited together footage from several of his earlier experimental films, arranging them for five 35mm projectors,

three side-by-side to form a triptych, and two overlapping these to provide additional color effects. Painted slides were also used to blur the edges of the projections." However, Fischinger is not usually credited in the program. Fischinger re-created his "multiple-projector performance several times, including a piece titled *Fever I II III* which reportedly had a musical score composed by Erich Korngold, and a screening at the prestigious Munich State Theatre in 1927, with the title *R-1, a Form-Play*, using a percussion ensemble as the music (which could drown out the noise of the several projectors)."[63]

Summary

Visual music can take two strands in its approach to the craft and presentation of itself as an art medium. It can focus on the craft of composition—working with mobile visual elements over time to be realized in time as a fixed-media video or film projection. Alternatively, visual music can focus more on the performance aspect, an improvisational approach or both, and hence focus more on the realization of mobile visuals elements via mechanical or generative means into a non-fixed media that exists mainly in its performance; the craft in this case often involves considerable technical skill in building a system or item that can realize a visual music in a real-time setting.

This essay explored some of the pioneering efforts of filmmakers from the absolute and abstract filmmaking traditions from the 1920s onward as well as the inventors of devices to compose or perform visuals like music from the late 19th century. Their efforts provide us today with much inspiration. What are of interest is how they sought connections between music and image, how this influenced their aesthetic strategy and how they realized their music to image ideas in their work. The essay focused on bringing forth the nuances of taking a visual music composition approach to draw out the manner in which visual music is about composition and the esthetics of composition; it also considered the influence of color to music correlations that inspired artists to build instruments to perform color and use light as a means of composing color harmonies analogous to music harmony. These pioneers provide us with the origins of a grammar

for working with the complementarity of music and image. This grammar of visual music continues to develop today as more artist, filmmakers and composers work with the complementarity of music and image and develop their methods for seeking out that complementarity.

Essay written by © Maura McDonnell, 2007

Biography

Maura McDonnell is a visual music artist and lecturer based in Ireland. She studied music and mathematics at The National University of Ireland, Maynooth and completed her M.Phil in music and media technology at Trinity College in Dublin. She currently lectures on the M.Phil. in music and media technologies course. After discovering the power of sound and image by completing a number of experimental audio-visual works, Maura has since and continues to embark on an inquiry into the origins and existing practice in visual music. For this purpose, she keeps a blog at http://visualmusic.blogspot.com.

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