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THE MUSICALITY OF THE VISUAL MUSIC FILM

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LIST OF TABLES

LIST OF FIGURES

ABSTRACT

This thesis explores the concept and expression of *musicality* in the absolute visual music film, in which visual presentations are given musical attributes such as rhythmical form, structure and harmony. The role of music has, in general, been neglected when analysing visual music textually and if discussed it has been examined predominantly from the academic vantage points of art and avant-garde film theory. To adequately scrutinise these texts I consider it essential to look at them not only in terms of their existence as *moving pictures* but also to give equal weight to their aural aspect and to consider them in terms of specifically *musical* parameters. This thesis therefore seeks to redress previous imbalances by undertaking a close analysis of the expressly musical qualities of these texts. Drawing on the seemingly disparate areas of film theory, art history, music theory and philosophy, it takes an interdisciplinary approach to investigating the measurable influence that wider contextual, philosophical and historical developments and debates in these areas bore on the aesthetics of specific visual music films.

By drawing on the analogy of the *absolute* in music to demonstrate how musical concepts can function across the disciplinary boundaries of music and film, the first half of this thesis illustrates how musical ideas can be applied both formally and conceptually to the moving image in order to elucidate the musical characteristics of the text. Using the notion of the absolute as a conceptual framework allows for a thorough overview of changing trends and aesthetics in music, film and art and the visual music film. The centrality of notions of the absolute to visual music is demonstrated through close analysis of films by Viking Eggeling, Hans Richter, Walter Ruttmann, Norman McLaren, James Whitney and Jordan Belson.

The second part of this thesis concentrates less on the philosophical vestiges carried over from musical thought to the visual music film, instead focusing on the variety of techniques and technological developments that evolved in tandem with the visual music film, each simultaneously exerting an influence on one another. It explores the effect that colour processing had on not only the visual but the overall audiovisual structure of the visual music film through a textual analysis of *Kreise* (1933) by Oskar Fischinger. It also investigates how particular styles of musical composition dictated the development of specific technical processes such as painting directly onto the celluloid strip, in order to capture the syncopated and frenetic musicality of jazz music. The case studies here are *Begone Dull Care* (1949) by Norman McLaren and *A Colour Box* (1935) by Len Lye. Further to this, it examines how the technical processes of animated sound emerged in the

search for a greater correlation between the visual and sound tracks of the visual music film through close analysis of *Synchromy* (1971) by Norman McLaren and the optical sound films of Guy Sherwin.

Finally, this thesis marries the inquiry into technological innovation of its second half with the historical, aesthetic and philosophical concerns of earlier chapters by considering the work of visual music pioneer John Whitney. Focusing on his digitally produced visual music films, the thesis explores Whitney's enduring concern with the unification of sound and image through the shared foundation of mathematical harmony.

CONTENTS

NB: In the course of this thesis I have included the birth/death dates for certain artists, academics and philosophers. This may not be normal practice, but it is sometimes necessary in this case as I am are providing an overview of how concepts develop in particular historical periods.

INTRODUCTION

From the Pythagorean fascination with the music of the moving celestial bodies to the lively moving images of Oskar Fischinger's (1900 - 67) abstract animation, there has been an enduring fascination with the representation of music in some way, shape, or form; a music for the eye, a *visual* music. But, to what precisely am I referring when I write of *visual music*? The term visual music is vague and amorphous, defying traditional categorisation. However, it is this very ambiguity and ability to transcend disciplinary boundaries that makes visual music such a unique entity. At its most literal it could be taken to mean a music that can be seen. This concept of a music that can be seen implies that this idea is grounded in the realm of sensory perception rather than traditional disciplinary categories or genres. This therefore makes it an all encompassing term that incorporates the field of art, sculpture, film, animation and architecture.

The term also announces its inherent hybrid nature by virtue of conjoining the senses of vision and hearing within its constituent words. This intimates that it requires the characteristics of at least two disciplines; one of which must be musical in nature and one that is primarily visual in order to be classified as visual music. This hybridity and ambiguity gives rise to problems of categorisation. Many visual music texts carry alternative labels and have been classified as visual music retrospectively. This does not necessarily mean that they no longer function as exemplars of these other categories; it merely suggests that can also function in another context simultaneously. These texts often did not fit neatly into existing categories and required a more porous one to take account of their unique hybrid qualities. Although the category of visual music was not necessarily in common usage during the creation of many of the visual music works included in this study, most of the visual music makers were unequivocal in their use of music as a governing force in their work. In spite of the fact that I have made explicit the hybrid nature of the visual music text, for the purposes of this thesis I am treating it, at least in part, as a distinct category.

This is not the first academic inquiry into the relationship between music and image in the visual music film or of music in the visual arts. Authors such as Peter Vergo and Edward Lockspeiser have undertaken learned and insightful studies into the correlation between music and the plastic arts. William Moritz has been the main authority on the history of visual music filmmaking and his writing has been an invaluable source of information for highlighting the work of visual music filmmakers, in particular Oskar Fischinger. The Centre for Visual Music and The Iota Centre have also been fundamental

in providing public access to articles and films through their on-line archives and stores. In the field of film and animation studies, writers such as Malcolm LeGrice, A.L. Rees and Standish Lawder have written about these musically grounded texts.

So, given the existence of this writing, why write about visual music? Although surveys exist in relation to the visual music film to a certain extent, there is a need for a more critical survey and more importantly there is a need to critically address the musical qualities of the films. My study differs from the aforementioned studies in several respects. These investigations have predominantly dealt with the visual qualities of visual music, skirting the issue of music and sound, while I am looking at the expressly musical qualities of the visual music texts with the aim of placing these qualities on an equal footing with image. This study is also as much about looking at the contextual, historical and philosophical basis of the visual music film as the texts themselves and will demonstrate that the films have changed and evolved in response to changing trends in art, music and society.

SCOPE OF THE INQUIRY

One of the most fascinating aspects of visual music is not only the endurance of the idea in its variety of forms but why this idea persisted for so long. Over the centuries people have attempted to visualise music using whatever means they have to hand. Gothic architects constructed their Cathedrals according to ratios of musical consonance.[1] Painter Paul Klee (1879 – 1940) employed the musical principle of polyphony to arrange the visual elements of his paintings. Many inventors such as French Jesuit Monk, Louis Bertrand Castel (1688 – 1757) and English composer Alexander Wallace Rimmington (1854 – 1918) (to name but two of many) have created colour and light organs to play visuals as one would play notes on a musical instrument. The list of visual music in all of its glorious permutations is wide and varied. Due to this fact, in addition to the term *visual music* encompassing so many disciplines, it would be difficult to adequately discuss them all within a single thesis, therefore I have chosen to focus on one aspect of visual music that I feel has been under-represented in literature; the *absolute* visual music film.

The terms *absolute*, *graphic* and *abstract* have all been used in relation to several of the films that I have chosen to include. Although they have all been used somewhat interchangeably there are subtle differences in meaning between the terms. P. Adams

[1] Peter Vergo, *That Divine Order: Music and the Visual Arts from Antiquity to the Eighteenth Century*, 2005, London: Phaidon Press Ltd., p. 95.

Sitney uses the term *graphic cinema* in relation to many of the films that I am discussing as examples of visual music.[2] Like theorists such as Malcolm Turvey and Thomas Elsaesser, he views the early black and white films of Hans Richter and Viking Eggeling as belonging in a lineage of formal cubist and neo-plastic art.[3] Sitney's categorisation of film under the moniker *graphic film* does not necessarily mean that all of these films can necessarily be classed as *musical.* Likewise my inclusion of a number of films that Sitney has classified as *graphic* does not necessarily mean that this study focuses only on films using only geometric shapes or traditional modes of animation. Many of the filmmakers discussed in this thesis use unconventional creative processes and some such as Jordan Belson (b. 1926) and Harry Smith (1923 – 91) use abstract images created through filmic processes rather than purely animated ones. Although all the films under discussion in this thesis are abstract in nature this is also not a guarantee of their musicality. The term *absolute* is potentially the most appropriate for this thesis.

The term *absolute* has been applied to the abstract visual music film from its inception, reinforcing the connection of this body of work to music. The first screening of Viking Eggeling's (1880 – 1925) film *Symphonie Diagonale* (1921- 1924), *Entr'acte* (1924) by Réne Claire, *Ballet Mécanique* (1924) by Fernand Léger and Dudley Murphy, *Lichtspiel Opus II* (1923), *Lichtspiel Opus III* (1924), and *Lichtspiel Opus IV* (1925) by Walter Ruttmann (1887 – 1941) and *Rhythmus 21* (1921-1924) by Hans Richter (1888 – 1976) in Berlin in 1925 was entitled *The Absolute Film Show*. The screening also included a live light show of "Color Sonata in Three Movements" by Ludwig Hirschfeld Mack (1893 – 1965).[4] Likewise critics from the *London Times* described the films, *Lichtspiel Opus II*, *Lichtspiel Opus III* and *Lichtspiel Opus IV* by Ruttmann as absolute films following a screening at the London Film Society in 1925. Academic William Moritz has also written an article referring to many of the visual music films that I am discussing in this thesis as absolute film, however he uses the term to make a connection between the nonrepresentational nature of these films and the abstract intangible qualities of music

[2] See Chapter 7 of P. Adams Sitney, *Visionary Film: The American Avant-Garde* 2nd Edition, 1979, Oxford: Oxford University Press.

[3] See Sitney, Thomas Elsaesser, "Dada Cinema" in *Dada Surrealism*, Volume 15, 1986 and Malcolm Turvey, "Dada between Heaven and Hell: Abstraction and Universal Language in the Rhythm Films of Hans Richter, *October, Vol. 105*, Dada, Summer, 2003, pp. 13 - 36.

[4] William Moritz, "Abstract Films of the 20s," published in program booklet, International Experimental Film Congress. Toronto, Ontario, The Art Gallery of Ontario, in association with the International Experimental Film Congress, May 1989.
http://www.centerforvisualmusic.org/Moritz1920sAb.htm [Accessed: June 7th 2011].

rather than engaging with the actual musical properties, abstract or not, of these films.[5] While I intend to draw on these ideas, I also seek to exploit the explicitly musical qualities of absolute music.

The term *absolute* in relation to the visual music film is drawn from the concept of absolute music. Although the idea of absolute music as both a universal and conceptual framework for the abstract visual music film is explored in great detail in Chapter Two and Three of this thesis it is worth, at this point in time, providing a brief description of the term. Drawing on terms set out by German musicologist Eduard Hanslick (1825 – 1904) in his influential 1891 treatise *On the Musically Beautiful: a Contribution towards the Revision of the Aesthetics of Music*,[6] the phrase absolute music refers to music that is free from extramusical considerations. In other words it is music that is abstract in nature; music that does not have an overt program; music that is not explicitly about anything; music for music's sake. Therefore, by virtue of drawing on this definition of absolute music, the films under consideration in this survey will be films that are abstract, graphic and non-figurative in nature and without overt program or narrative.

A certain volume of literature exists around this body of work but there remains a need for these films to be reassessed in terms of their musical aspects. As I mentioned above, many of the films that I am classifying as visual music films carry other labels, so what is it that makes them visual music specifically? In answer to that question, they are films that I would consider to have particularly musical qualities to them. Of course most films by virtue of unfolding over time and the power of editing have certain musical qualities to them but I am interested in films such as those by Oskar Fischinger that have a strong relationship with music and for the most part are attempting to represent music pictorially in some way, shape or form. This is not necessarily the only qualifying factor for inclusion. Films that attempt to represent the structure of music such as Hans Richter, Viking Eggeling and John Whitney's (1917 – 95) engagement with the musical concept of counterpoint are also of vital importance to this investigation. The same can be said for films such as those by Jordan Belson, Norman McLaren (1914 -87) and James Whitney (1921 – 82) that compose visual music films predicated on more philosophical concerns.

There is also the question of intent. Most of the films that I have included have been composed with the intention of visualising music in one way or another but not all of

[5] William Moritz, "The Absolute Film," Lecture notes, WRO99, Media Art Biennale. Wrodaw, Poland, 1999. http://www.iotacenter.org/visualmusic/articles/moritz/absolute [Accessed: June 7th 2011].

[6] Eduard Hanslick, *On the Musically Beautiful: A Contribution towards the Revision of the Aesthetics of Music* 8th Edition (1891), Geoffrey Payzant (Trans.), 1986. Indianapolis: Hackett Publishing Company.

them. I have included films that I consider to have musical qualities to them or that have already been classified as visual music films by other writers as these texts need to be reassessed by taking their musical qualities into account in a more critical manner.

This narrowing of critical focus has led to some conspicuous omissions to the scope of this inquiry. I have chosen not to deal with live visual music performances even though many of the filmmakers that I am focusing on made forays into that area. Some filmmakers such as John Whitney (1917 – 95) had ambitions toward creating a visual music that could be played in real-time as music was played on an instrument. Others such as Paul Sharits (1943 – 93) have reworked their films to function in tandem with live musical accompaniment. Some filmmakers such as Jordan Belson, Oskar Fischinger and Dwinell Grant (1912 – 91) have created live visual music that exists in separation from their visual music films. Although I touch on some of these attempts, it is only in relation to their visual music films.

I have also chosen to exclude non-abstract visual music films. Many films have musical qualities to them but I am not necessarily classifying them as visual music texts. Authors such as William Moritz and A.L. Rees have included abstract films such as *Ballet Méchanique* (1924) by Fernand Léger (1881 – 1955) and Dudley Murphy and *Entr'acte* (1924) by René Clair (1898 – 1981) in the same categories of visual music as *Symphonie Diagonale* (1921-24) and *Rhythmus 21* (1921-24). In the case of Rees, he never actually refers to them as visual music but as *absolute* films. Although these films are abstract in nature, and have been labelled as absolute by the curators of the infamous *Absolute Film Show* in Berlin in 1925, I do not consider them to be truly *absolute* as they are, to a certain extent, figurative, therefore I have decided not to include them in my study.[7]

Danijela Kulezic-Wilson has conducted penetrative and detailed analysis of the musicality in feature length fiction films such as Darren Aronofsky's *Pi* (1998) and P.T. Anderson's *Magnolia* (1999).[8] This category of film also resides outside the scope of my study. Despite their obvious musicality I have also excluded music videos and advertisements from my study. Although music video, in particular, is by definition bound

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[7] See Cindy Keefer, "'Space Light Art" - Early Abstract Cinema and Multimedia, 1900-1959," White Noise Exhibition Catalogue, ACMI Melbourne, 2005, Revised 2008-2009. http://www.centerforvisualmusic.org/CKSLAexc.htm [Accessed: June 4th 2011], Moritz, "Abstract Films of the 20s," *op. cit*., and "The Absolute Film," *op. cit*.

[8] See Danijela Kulezic-Wilson, "The Musicality of Film Rhythm," *National Cinema and Beyond*, Hill, J. and Rockett, K. (Eds.), 2004, Dublin, Four Courts Press; *Composing on Screen: The Musicality of Film*. Diss. 2005, University of Ulster, Print and "Musical and Mythical Patterns in Paul Thomas Anderson's Magnolia," *Film History and National Cinema*, Hill, J. and Rockett, K. (Eds.), 2005, Dublin: Four Courts Press.

to music for its structure, it does not belong in this thesis for reasons of time and philosophy. Firstly, music video began to gain prominence at the point at which my study ends and secondly, they were created with a different philosophy and intent than the films that I have chosen to include. Music videos are predominantly cultural commodities created and distributed as advertisements to sell the music that they are representing. True, many visual music films that I am looking at, for instance *Kreise* (1935) by Oskar Fischinger and *A Colour Box* (1935) by Len Lye (1901 – 80), have functioned as advertisements for products and services but this was on the point of completion. They were conceived as visual music films first and foremost. I do not mean to dismiss music video as inferior or tar all music video with the same brush particularly as it is music video that has brought me to the visual music film. I firmly consider them to share many of the same musical qualities as the abstract films that I have included and, indeed, Carol Vernallis has written an excellent study foregrounding the musical qualities of music video entitled *Experiencing Music Video: Aesthetics and Cultural Context*.[9] They are merely excluded for the reasons that I mentioned above. Likewise, musicologist Nicholas Cook has focused on the musicality of advertisement and multimedia in his book *Analysing Musical Multimedia*.[10]

I have also excluded texts that do not develop temporally as music does such as abstract painting and architecture. Although I have written about these disciplines in the course of this thesis it is to reveal the influence that these arts have exerted on the development of abstract visual music film or for the purposes of demonstrating a comparison between the aesthetics or structure of these other forms with those of the visual music film. Visual music in these media has been comprehensively investigated by authors such as Hajo Düchting, Edward Lockspeiser, Simon Miller-Shaw and Peter Vergo.[11]

Another limitation that has been placed on the scope of this inquiry is that of timescale. The history of visual music in its myriad of forms stretches back centuries but the visual music animation film has a natural start point for investigation as it is so clearly

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[9] Carol Vernallis, *Experiencing Music Video: Aesthetics and Cultural Context*, 2004, New York: Columbia University Press.

[10] Nicholas Cook, *Analysing Musical Multimedia*, 2004, Oxford: Oxford University Press.

[11] See Hajo Düchting, *Paul Klee: Painting Music – Pegasus Series*, 2002, London: Prestel; Edward Lockspeiser, *Music and Painting: A Study in Comparative Ideas from Turner to Schoenberg*, London: Cassell, 1973; Simon Miller-Shaw, *Eye-Music: Kandinsky, Klee and All that Jazz* with F. Guy and M. Tucker, 2007, Chicester: Pallant House Press, *Visible Deeds of Music: Art and Music from Wagner to Cage*, 2004, U.S.: Yale University Press and Vergo, *That Divine Order, op. cit.*, *The Music of Painting: Music, Modernism and the Visual Arts from the Romantics to John Cage*, 2010, London: Phaidon Press.

linked to the inception of animation in its earliest form. The earliest completed visual music films still in existence by Viking Eggeling, Hans Richter and Walter Ruttmann are often written about, not as expressly visual music films, but as examples of early cinema, Dada cinema or the earliest example of abstract animation.[12] Therefore this enquiry will begin in the 1920s with the completion of Eggeling's, Richter's and Ruttmann's films and will focus on the development of the visual music film in line with changing trends in music, art and thought in as rigorous and thorough a manner as possible.

As the visual music animation is continuously evolving and changing it is more difficult to choose an end point for this inquiry. Nevertheless, for the purposes of this thesis I have chosen the transition from analogue to digital animation processes during the mid-1970s as the cut-off point for my study. The transition to digital processes changed the way in which the visual music film could be realised. Up until this point visual music animation was predominantly created by a direct physical intervention by the filmmaker involved. This took a number of idiosyncratic forms, particular to the individual filmmaker and is not necessarily restricted to traditional hand-drawn processes. These processes include painting directly onto film, mechanical systems, photographing individual drawings and analogue computers to name but a few. Even Whitney's digital computer system necessitated a manual analogue input of data to create his graphic forms. As the development of increasingly more sophisticated digital computer processes theoretically rendered this need for a manual input obsolete this seems like a natural point to end this study.

This is not to say that a physical or manual intervention in the composition of the visual music film is necessary but rightly or wrongly most visual music films are intimately associated with their creators. They are also intrinsically linked to their modes of production as chapter four will demonstrate, therefore the point at which visual music films could be entirely computer generated with the minimum of human intervention is a good point to conclude this investigation.

Due to the link between the visual music films under consideration in this thesis and their architects as I have intimated above, I have also chosen to limit this study to

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[12] Leopold Survage created an outline for visual music film in colour called *Le Rhythme Colore* between 1912 and 1914. Further to this Italian brothers and futurists Ginna and Corra completed a series of the early known abstract animated films to pursue an overt musical analogy between 1911 and 1912 but they are no longer known to be in existence. For further information on Ginna and Corra's experiments in visual music see: Giannalberto Bendazzi, "The Italians Who Invented the Drawn-on-Film Technique," *Animation Journal*, Spring 1996,Tustin: AJ Press, pp. 69-77 and Malcolm LeGrice, *Abstract Film and Beyond*, 1977, London: Studio Vista. pp. 17 – 20.

specific filmmakers. By doing this I do not mean to imply that these were the only filmmakers working in this field or the most important. Moreover, I do not wish to detract from the contributions made from other filmmakers. However, as this thesis follows a chronological order of the development of the visual music film I have chosen to include work by filmmakers that I regard as pertinent to my overarching argument. Within this selection of filmmakers I have chosen to include artists such as Norman McLaren and Guy Sherwin (b. 1948) that I feel are currently underrepresented in the scholarship of visual music. Norman McLaren's extensive body of work is often absent from academic literature discussing visual music. Likewise Sherwin's optical sound films have not been extensively written about as visual music films. Nonetheless the work of both filmmakers exhibit obvious musical characteristics and were made with the intention of visualising sound so hopefully this inquiry will go some way to rectifying this lack of awareness.

Further to this, I have also chosen to incorporate filmmakers such as Eggeling, Fischinger, the Whitney brothers and Belson, who are considered to reside within the traditional visual music canon and whose work I deem to require a re-examination in terms of their musical qualities. A number of omissions may seem odd to some readers but in the case of Stan Brakhage (1933 – 2003), Mary Ellen Bute and to a certain extent Harry Smith, it was the constraints of time and space that forced me to limit the amount of words devoted to their work in favour of films that I deemed to be more relevant to the line of my argument.

Although this thesis is predominantly concerned with *musicality* in the visual music film, this is always considered as part of the audiovisual structure, the intention being to redress the imbalance between sound and image in animation and film studies research. This emphasis on the musical qualities of the films does not mean that this inquiry is explicitly aimed at the musicologist. It is walking a tightrope somewhere between the disciplines of film studies and musicology and functioning as a conduit between the two fields. Musical analysis in particular can take many forms. Some forms such as Schenkerian analysis, developed by Austrian musicologist Heinrich Schenker (1868 – 1935), looks at the formal structure of music, other forms such as that developed by Donald Francis Tovey are dictated in prose and focus on the stylistic elements of music, while more still are predicated on philosophical and figurative description.

Tovey's prose commentary began as programme notes to a series of concerts that he conducted in Edinburgh and were intended for a general rather than the specialist

audience that enjoyed Schenker's approach. In his book *A Guide to Musical Analysis*[13] musicologist Nicholas Cook states that Tovey's "straight-forward, non-technical description of music"[14] using literary devices like metaphor make an "excellent starting point for a more technical analysis"[15] and, as Cook later writes, the important thing is not to invent new techniques for analysis but rather make the fullest *use* of the ones that already exist, employing them in combination.[16] This is what I am trying to do when attempting to formulate an interdisciplinary approach that merges film, music, philosophy and culture in order to find a method of looking at bodies of work that due to their hybrid nature can never be adequately scrutinised using methodologies drawn from only one discipline.

STRUCTURE AND CONTENT

In addition to my concern with formal textual analysis this thesis is structured chronologically as much as possible. This is in order to explore debates in music, art and film and demonstrate how changing aesthetics and philosophies in these areas are manifested in the visual music film. There are deviations from this form as some filmmakers, particularly those such as Guy Sherwin and Norman McLaren, are not formally aligned to any particular movements of visual music that I have identified in the course of this thesis such as the West Coast visual music makers, Jordan Belson and John and James Whitney. In these cases they have been loosely aligned with the aesthetics and philosophies of particular periods in order to further illuminate my argument.

The purpose of this introductory chapter has been to outline the structure and aims of this thesis, define the scope of my inquiry and identify gaps in literature where further scholarship may be undertaken to address or readdress existing readings of the visual music film. Building on this, the first chapter in my thesis elaborates on some of the points raised in this introduction. It surveys existing literature and debates surrounding the visual music film, examining the manner in which it has thus far been investigated and identifying the need for a re-examination of the visual music film that takes in account the particularly musical characteristics of the films. It looks specifically at the musical analogy in art and literature that preceded its adaptation to the film form and the ways in

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[13] Nicholas Cook, *A Guide to Musical Analysis*, 1987, Oxford: Oxford University Press.
[14] *ibid.*, p. 11.
[15] *ibid.*, p. 12.
[16] *ibid.*

which this musical analogy has been subsequently expressed in the visual music film. It will expose the visual music film's origins in visual art and consider why it is still considered as an extension of painting, a viewpoint that ostensibly privileges its visual qualities. It will also provide an example of the type of analysis that I am attempting to undertake in the course of this thesis through a close textual analysis of the musical characteristics of one of the earliest examples of the visual music film, *Symphonie Diagonale* (1921-24) by Viking Eggeling.

As I stated previously, absolute music not only provided the ideal theoretical foundation for abstract animation, but the late nineteenth century formalist debate in music over absolute and program music also established a theoretical precedent for a discourse on abstract animation. Two distinct categories of the *absolute* emerged during the nineteenth century, the *formal absolutism* of German musicologist Eduard Hanslick, who considered the tone material of music to express the musical idea and the *spiritual absolutism* of philosopher E.T.A Hoffmann, who posited that music due to its intangibility could be utterly transcendent. Remaining mindful of this, Chapter Two draws a direct parallel between the visual music film and *absolute* music, proposing that the two categories of the *absolute*, formal and spiritual, in music also exist in relation to the visual music film. This chapter will therefore investigate the characteristics of what I have classified as formally absolute visual music films through close textual analysis of *Rhythmus 21* (1921- 24) by Hans Richter, *Lichtspiel Opus I* (1921) by Walter Ruttmann and the trio of ascetic *Line* films, *Lines Vertical* (1960), *Lines Horizontal* (1962) and *Mosaic* (1965) by Norman McLaren.

Chapter Three expands on the concept of the absolute, focusing on the second category of the spiritually *absolute* in music and the visual music film. It explores this concept through an investigation of the spiritually informed practices of the visual music makers on the West Coast of America. It provides close textual analysis of the *cosmic* films of James Whitney and Jordan Belson in order to demonstrate how more spiritual concerns can be realised in the visual music film just as they can be in music.

Bearing in mind the link between the aesthetics of visual music films and their relationship with music made in the previous two chapters, Chapter Four provides a survey of the techniques and technological developments that have occurred symbiotically with the evolution of the visual music film. This chapter consists of two parts. The first will examine how the advancement of the visual music film exerted an influence on the development of related technological processes and vice versa. An examination of the

development of colour processes, illustrated through a close reading of *Kreise* (1935) by Oskar Fischinger, will reveal the impact that colour had on the aesthetic of the visual music film. Furthermore, it will investigate how certain genres of music such jazz, with its key qualities of energy and syncopation, dictate the development or use of specific animation techniques and processes. The focus here will be on *Begone Dull Care* (1949) by McLaren and *A Colour Box* (1935) by Len Lye in order to ascertain the link between direct-to-film animation processes and jazz music.

Part two of this chapter focuses on the animation processes involved in the creation of a synthetic soundtrack, a visual music where the audience can see the sound of an image or hear the shape of a sound. There are two divergent schools of thought regarding the synthetic or animated soundtrack. The first was concerned with creating a new form of sound-writing, a literal sound *cine-stylo*, to inscribe musical sounds directly onto the optical soundtrack of the film stock. This will be illustrated through a close reading of *Synchromy* (1971) by Norman McLaren. The second served to investigate the sound produced by graphic forms or objects. *Phase Loop* (1971) and *Sound Shapes* (1972) by Guy Sherwin will be used to augment this investigation.

Drawing on the notion of music and therefore the visual music film having transcendental qualities and the idea of the aesthetics and technology surrounding the visual music film evolving concurrently, Chapter Five examines mathematics as a universal language that theoretically underpins the workings of the entire universe. It is this universality that makes mathematics the ideal language for a visual music, based not on metaphor, but one in which there is a one-to-one correlation between image and music, a visual music where the sound and image share the same mathematical code. This chapter will focus on American visual music filmmaker John Whitney's ideas of *digital harmony* and his attempts to create visual music films through his use of visual images and patterns drawn from mathematics in the course of his filmmaking career. It will also demonstrate how John Whitney and his digitally generated visual music films allow him to function as a transitional figure between visual music films that require sustained physical interaction with the filmmaker and the sophisticated generative based visual music that has become the mainstay of musical visualisation programs and live musical events.

The conclusion discusses the findings of my research and how it provides a unique contribution to the scholarship of the visual music film. It is here that I reflect on the methodology I have employed, reconsider the scope of my investigation and suggest potential avenues for further research. By the end of this thesis I hope to have provided

original readings of visual music films, predominantly taken from a traditional canon of abstract film animation, but not, until now, grouped together under the umbrella of visual music. These readings are marked distinctively by their attention to the films' specifically musical qualities, formally, structurally and philosophically, and their attempt to relate the films' musicality to historical and technological developments.

CHAPTER 1:

QUESTIONS OF ATTRIBUTION AND CONTRIBUTION: WHAT CONSTITUTES A VISUAL MUSIC FILM?

Unlike some other forms of avant-garde film, on which one can consult volumes, the subject of visual music in experimental cinema has been under-represented in film history as a distinct category. This is not unlike the problems of "attribution"[1] and "contribution"[2] that Thomas Elsaesser points out in relation to research on Dada cinema. Elsaesser asserts that the ambiguity surrounding what constitutes a Dada film is problematic as the makers of Dada films often aligned themselves with movements other than Dada. For example Fernand Léger was generally considered to be a Cubist painter, yet his film *Ballet Méchanique* (1924) was considered to be inherently Dadaist by Hans Richter.[3] In the same fashion *Anémic Cinema* (1926) by Marcel Duchamp is also referred to as a Dada film in spite of Duchamp's protestations that it was not a film at all but an element of his motorised sculptures that he referred to as *precision optics*.[4] Another problem that arose for those attempting to create a cohesive theory of Dada cinema was the sheer diversity in visual aesthetics and, to a certain extent, ideological concerns within the body of films. Hans Richter's series of *Rhythmus* films, with their hard-edged abstract images are clearly very different to Francis Picabia's (1879-53) quintessentially Dadaist film *Entr'acte* (1923), which subverts traditional notions of narrative cinema by virtue of parodying *bourgeois* concerns such as the high art form of ballet or the solemnity of the funeral. Yet authors such as Malcolm Turvey have made a convincing case as to why both of these films have equally valid claims to the title of Dada.[5] While I do not wish to focus on Dadaism per se, the problems of what exactly a Dada cinema comprises is a useful point of departure for the problems of defining *visual music* as a distinct body of work.

The visual music film shares the same problems of *attribution* and *contribution* suffered by Dada films. Should one resist calling *Rhythmus 21* (1921-24) by Hans Richter a visual music film because Malcolm Turvey and indeed Richter himself have made a case for it as an exemplar of Dada or can it be appropriated as a work of visual music film by

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[1] Thomas Elsaesser, "Dada Cinema," *Dada Surrealism*, Volume 15, 1986, p.14.
[2] *ibid*.
[3] *ibid.*
[4] Marcel Duchamp, Interview, *Dialogues with Marcel Duchamp*, Pierre Cabanne, 1987, Cambridge: Da Capo Press, p. 64.
[5] Turvey, *op. cit.*

virtue of its musicality? The boundaries between different types of experimental cinema whether they be absolute, Dadaist, poetic, structuralist or post-structuralist are salient but not immoveable. Cinematic work can diffuse across the semi-permeable membranes of classification to be consumed by another cell of the avant-garde ripe for re-classification. Perhaps an apt metaphor for what I am attempting to do with this thesis is provided by the concept of endocytosis, with the category of "visual music" functioning as a roving cell absorbing works from other disciplines by engulfing them in order to create a new discrete form of film replete with hybrid characteristics. This idea is not unlike the reclassification of 1930s-40s Hollywood 'B' movies that combined elements of melodrama, crime, thriller and gangster films into the generic category of film noir by French cinéastes such as Nino Frank, Jean Pierre Chartier, Raymond Borde and Étienne Chaumeton during the 1940s.and 1950s.[6]

Bearing in mind this problem of contribution and attribution that exists in relation to the visual music film and the problems relating to its existence as a hybrid entity, at its most basic level formed from music and the moving image, it is not surprising that visual music, like film noir has, as a distinct category, developed retrospectively. The majority of the films that I am examining as works of visual music were not necessarily conceived as such or as part of a formal movement even though the wish to represent or capture the essence of music may have been the driving force behind the work. Apart from the recent references to the films often described as *visual music* in the wake of a renewed vogue for synaesthesia, a neurological condition in which senses are cross-modally stimulated, in the arts, visual music films have generally turned up in histories of avant-garde cinema, experimental or abstract film by authors such as A.L. Rees, David Curtis and Malcolm Le Grice. The focus of these accounts tends to sever the examples from their musical connections and to appropriate them as the roots of a tradition either of graphic or structuralist cinema.

There has of late been an attempt to address this discrepancy of representation. In 2005 the Hirshhorn Museum and Sculpture Garden, Washington, D.C., and The Museum of Contemporary Art, Los Angeles (MOCA) organised a unique exhibition charting the development of a visual art form based on the notion that art should represent music. The preface to the book, which accompanied the exhibition, contends that although visual

[6] Previous to this re-classification of film noir by writers such as Borde and Chaumeton in their 1955 book *A Panorama of Film Noir, 1941-53* film noir had arguably been neglected. As Paul Schrader reasons: "For a long time *film noir*, with its moral primitivism, and the gangster film, with its Horatio Alger values, were considered more American than the *film noir*." Paul Schrader., "The Film Noir," *Filmex*, 1971, http://www.paulschrader.org/articles/1971-FilmNoir.html [Accessed: 16th May 2011], p. 8.

music was not a *formalised movement* it was nonetheless a noteworthy vein winding its way through modern and contemporary art. More importantly it also asserts that:

> The achievements of visual-music artists are so profuse and varied that no single exhibition could encompass the full range of work produced over the past ten decades. Therefore, rather than an encyclopaedic survey, this exhibition presents a highly selective overview of some of the major figures and key moments in the unfolding story of visual music.[7]

This existence of visual music in such a myriad of forms in addition to its status as a chimeric construction is one of the fundamental problems that exist when attempting to examine it as a distinct ontological entity.

Associations such as the Center for Visual Music (C.V.M.) and The Iota Center in Los Angeles and academics such as William Moritz have gone some way to foreground the visual music film as a discrete form. The C.V.M. is a film archive dedicated to preserving, archiving and distributing visual music in its myriad of forms. They have a substantial on-line library of scholarly research and material available to the general public and have been steadily releasing visual music films on DVD. Likewise, The Iota Center aims to contextualise what it views to be "historically underrepresented experimental works,"[8] in order to both enrich academic investigations and inspire new artists to build on the legacy by the filmmakers in their collection. In addition the Iota Center maintains an archive of the writings of Dr. William Moritz, a filmmaker and academic, who arguably did the most to champion the cause of visual music as an ontological entity through his research and writing. It is due to the attribution of the label *visual music* by these parties and claims made by the visual music filmmakers themselves that many of these works have been reassessed. There still remains, however, room for an examination based on the musical qualities of these films.

Bearing this in mind this literature review will provide an overview of the work and debates primary to the interdisciplinary methodology of this thesis and establish a framework for examining the aesthetics of the visual music film by means of a musical paradigm. Due to the hybrid nature of the body of work under consideration in this thesis this literature review takes a non-standard approach that I consider to be more appropriate in this instance. Rather than surveying the key literature by discipline (for example, art history, film theory, musicology or philosophy) or even chronologically I have organised the discussion of literature according to key concepts that I have identified as prominent

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[7] Ned Rifkin and Jeremy Strick, "Foreword," *Visual Music: Synaesthesia in Art and Music since 1900*, 2005, London, Thames and Hudson, p. 10.

[8] http://www.iotacenter.org/about [Accessed: 23rd May 2011].

across the existing body of relevant literature. I am therefore drawing on related material from various disciplines in order to conduct a comparative study of discussions of the visual music film that identifies productive convergences and divergences in the existing literature.

The first area of debate that I will discuss is the discourse around the idea of the *musical analogy* that underpins the visual music film. I will consider this by investigating the various ways the musical analogy has been interpreted by artists, musicians and filmmakers. This section will pay special attention to particular ways in which the analogy has been adapted to create models of visual music rooted in the concepts of synaesthesia and multimedia. The second significant issue that I will examine in this chapter is the concept of visual music as a *motion painting*. This idea espoused in literature by authors such as Standish Lawder, Malcolm LeGrice, P. Adams Sitney, Robert Bruce Rodgers and Lorettann Gasgard Devlin grounds the visual music film as an evolution of painting. It is here that I will examine both the validity and limitations of this approach that, in general, severs the visual of the visual music text from its musical origins. Finally this review will draw on the issues raised during my investigation into the musical analogy and assert the need for a comprehensive study of the formal aspects of the visual music film's unique synthesis of film, art and music through close textual analysis. To reinforce this need for a new reading of these films I will provide a close reading of *Symphonie Diagonale* by Viking Eggeling as an example of the type of analysis that I consider to be lacking in existing discussions of the visual music film.

THE MUSICAL ANALOGY

The words *visual music* in the title of this thesis alerts its audience to its musical foundation from the outset. It is no surprise, therefore, that the musical analogy has served as an entry point for those who wish to discuss or understand this body of work. This analogy is not unique to the visual music film. It has been used as both a way of structuring and comprehending certain works of art and music. The musical analogy in the visual arts and music has been thoroughly discussed by authors such as Peter Vergo, Edward Lockspeiser and Simon Miller-Shaw.[9] John Gage and Vergo have also provided comprehensive and detailed histories of colour-music correspondences while Lawrence E.

[9] See Lockspeiser, *Music and Painting, op. cit.*, Miller-Shaw, *Eye-Music, op. cit.*, *Visible Deeds of Music op. cit.* and Vergo, *That Divine Order, op. cit.; Music of Painting, op. cit.*

Marks, Cretien Van Campen, Simon Baron-Cohen and John Harrison have provided a comprehensive investigation of it in terms of the neurological phenomenon of synaesthesia.[10] As this thesis is concerned predominantly with the musical analogy in relation to the visual music film I do not wish to repeat or trespass on what they have already written. Bearing this in mind however, it is useful at this point to outline the importance of this analogy through several of its permutations in order to fully appreciate the origins of visual music in painting, particularly as it is a key point of reference for film theorists such as Lawder and LeGrice.

Two dominant models can be discerned in relation to the musical analogy in the visual music film and by extension the arts. The first is predicated on the idea of intersensory correspondences, or synaesthesia, and the other is based on the idea of multimedia but both have, at their roots, the idea of a *musical analogy*. While I intend to discuss each of these models in this chapter it is useful at this juncture to discuss the musical analogy that gave rise to both.

"The aesthetics of one art is that of the other only the material is different,"[11] observed Immanuel Kant (1724 – 1804). Kant was not unique in his view that the arts can potentially share a collective aesthetic. Musical historian Edward Lockspeiser, writing of the visual associations in the works of early Romantic composers, tells us that these associations:

> were not an isolated manifestation. They were part of an all-embracing scheme in which, according to some strange law evident at certain periods in artistic evolution, there was a constant interchange or cross-fertilisation of values.[12]

This is true not only of the Romantic period of the eighteenth century but also the modernist period and indeed throughout history. Music, as I will demonstrate in the following chapter, may have become the conceptual paradigm for art in the eighteenth century with the elevation of instrumental music to the highest form of music, to which all the others arts should aspire,[13] but there was nothing new about the musical analogy in the

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[10] John Gage, *Colour and Culture: Practice and Meaning from Antiquity to Abstraction*, 1993, London: Thames and Hudson; *Colour in Art*, 2006, New York: Thames & Hudson; John E. Harrison and Simon Baron-Cohen (Eds.), *Synaesthesia: Classic and Contemporary Readings*, 1997, U.K.: Wiley-Blackwell; Lawrence E. Marks, *Synesthesia: The Lucky People with Mixed Up Sense*, 1975, Ziff-Davis Publishing Company; Cretien van Campen, *The Hidden Sense: Synesthesia in Art and* Science, 2010, Cambridge: M.I.T. Press and Vergo, *That Divine Order, op. cit*.

[11] Immanuel Kant, *Critique of Judgment,"* Werner S. Pluhar (Trans.), 1987, Indianapolis: Hackett Publishing, p. 82.

[12] Lockspeiser, *op. cit.*

[13] See Lydia Goehr, *The Imaginary Museum of Musical Work: An Essay in the Philosophy of Music*, 1992, Oxford: Clarendon Press and Carl Dahlhaus, *The Idea of Absolute Music*, Roger Lustig (Trans.), 1991, Chicago; London: The University of Chicago Press.

arts. The analogy of mathematics and music, to use but one example, stretches back to antiquity when Pythagoras discovered in 6th century BC that musical notes could be represented as a sequence of numerical ratios.[14]

Walter Pater's (1839 – 94) proclamation that "all art aspires towards the condition of music,"[15] made during the Romantic period, was zealously seized upon in the visual arts. The musical aspirations of painters such as James McNeill Whistler (1834-1903), Paul Klee (1879-1940), Theo Van Doesburg (1883 – 1931), Georgia O'Keeffe (1887 – 1986) and Barnett Newman (1895-1970) were pronounced in the titles that they bestowed on their paintings. Newman, for example, created a series of eighteen lithographs entitled "18 Cantos" that were inspired by the musical structure of a symphony.[16]

This idea of the musical analogy between music and visual art proved essential to the development of abstraction in art in the early twentieth century. Painters Wassily Kandinsky (1886 – 1944) and Frantisek Kupka (1871 – 1957) asserted that the "formal abstract structure of musical composition pointed the way towards a new art,"[17] while the direct and emotional appeal of music indicated a condition to which art should aspire. Jeremy Strick writes that "music, with its notes and phrases, harmony and dissonance, compositional structures and abstract notational system, lent itself most readily to such analogy."[18] Some artists appropriated many of the formal structural elements of music in order to structure their artwork. R. Bruce Elder contends that in 1910 Kupka became the first painter to "arrive at the principle of sequential composition" based on progressions of colour.[19] Kupka encapsulates his intention thus:

> By using a form in various dimensions and arranging it according to rhythmical considerations, I will achieve a 'symphony', which develops in space as a symphony does in time.[20]

Those interested in creating visual music have at times drawn on the formal qualities of music. Some have exploited the emotional and expressive qualities of music that possess the power to influence audiences on an affective level, while others have

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[14] See Chapter Five for greater elucidation on this point.

[15] Walter Pater, *The Renaissance Studies in Art and Poetry,* Adam Philips (Ed.), 1986, Oxford and New York: Oxford University Press, p. 86.

[16] Sotheby's Catalogue Notes for "18 Cantos," http://www.sothebys.com/app/live/lot/LotDetail.jsp?sale_number=N08442&live_lot_id=126 [Accessed:18th December 2010].

[17] Jeremy Strick, "Visual Music." *Visual Music: Synaesthesia in Art and Music since 1900.* 2005. London: Thames and Hudson, p. 16.

[18] *ibid.*

[19] R. Bruce Elder, "Hans Richter and Viking Eggeling: The Dream of Universal Language and the Birth of the Absolute Film," *Avant-Garde Film,* Alexander Graf and Dietrich Scheunemann (Eds.), 2007, U.K.: Rodopi, p. 20.

[20] Frantisek Kupka cited in Elder. *op. cit.*, p. 20.

employed one or other of music's philosophical precepts such as music's ability to function *absolutely* or as a universal language.

Many visual music makers have drawn on music's formal structure, as demonstrated in the case of Kupka, to lend shape to their work. However, not all of those concerned with the composition of the visual music film have attempted to create a literal translation of music. Many have been inspired by music on a more metaphorical level. They have been inspired by the movement, rhythm and temporality of music. For instance, in the field of art, Edward Lockspeiser offers up the example of J.M.W Turner (1775-1851) as aspiring to the "musical state"[21] and, in addition, having much in common with the creative ideology of German Romantic composer Richard Wagner (1813 – 1883). He writes:

> In the work of Turner, as we have seen, almost everything aspires to the musical state. This seemingly overbold statement is justified by the fact that the dream-like turbulent nature scenes of Turner, like the scenes springing from the same source in Wagner, have no antecedents. Turner and Wagner came upon this dream state in their portrayal of the elements instinctively. None of the early nineteenth-century painters or composers had this quality. The fact that their visions were expressed in a static or a fluid state is of little importance, since Turner and Wagner were concerned with movement, and music, according to an ancient definition valid still today, is 'the art of good movement.'[22]

It is not surprising therefore that this art of movement was eventually extended into the creation of temporal transitions between images when the technology became available. Norman McLaren, in particular, was certain that movement was both at the heart of being human and the heart of cinema, stating in a speech at a music festival in Aspen in 1956:

> A basic quality of us human beings, and in fact all living creatures, is that we are always moving... We are creatures of movement. Almost all sensory stimuli picked up by our sense receptors are in movement; if not by motion of the world around us, then by the emotion of our own bodies.[23]

He reasons that this movement, intrinsic to the state of being human, is the reason why humans respond to cinema on such a gut level. At its most basic, film is perceived as movement, the image consists of moving light waves, while the sound is composed of undulating sound waves that cause our ear drums to vibrate sympathetically. It is this quality of movement that allows film to approach the state of music.

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[21] Lockspeiser. *op.cit.*, p. 51.
[22] *ibid.*
[23] Norman McLaren, "Notes for Aspen," 1956, McLaren Archive at the University of Stirling.

This importance of movement as the basis for the musical analogy is echoed by Ralph K. Potter in his research into audiovisual transmission at Bell Laboratories during the 1940s. In the course of his investigation he states that some audiovisual compositions are more acceptable to audiences than others on an emotional plane due to the quality of movement. As Potter asserts it is motion that creates an association between sound and image. A motionless line bears no relationship to music but as soon as it moves it attaches itself to the music, binding together the visible and the audible.[24] As will become apparent in this chapter, this idea of the musical analogy in art, particularly in the early twentieth century would give rise of the visual music films of painters such as Eggeling, Richter and Ruttmann, who introduced the elements of time and movement to their films in order to more closely approach the state of music. The musical analogy was not only an inspiration to visual artists but was to serve as muse to wider cultural movements. The musical analogy has taken forms other than the appropriation of the temporal/kinetic characteristics of music, an appropriation that I would consider an essential if not definitive quality of the visual music film.

SYNAESTHESIA

As previously stated one of the main models for the musical analogy was predicated on the idea of intersensory correspondence or synaesthesia. It is difficult to engage with the concept of "visual music" without considering the debates around the psychological phenomena of synaesthesia. One rarely reads about "visual music" in its many varied forms without mention of the term. Psychologists John E. Harrison and Simon Baron-Cohen state:

> We, along with others (Vernon 1930; Marks 1975; Cytowic 1989, 1993; Motluk 1994), define synaesthesia as occurring when stimulation of one sensory modality automatically triggers a perception in a second modality, in the absence of any direct stimulation to this second modality.[25]

In *Synaesthesia: an Introduction* they identify and place in categories various types of synaesthesia. They demarcate developmental synaesthesia as idiopathic, or arising from an unknown cause, in order to distinguish it from acquired synaesthesia and pseudosynaesthesia. The main characteristics that they set out is that it has a childhood onset, it is unrelated to hallucination or psychotic visions, it differs from images

[24] Ralph K. Potter, "Audivisual Music" in *Hollywood Quarterly, Vol. 3, No. 1,* Autumn, 1947, Berkeley: University of California Press, p. 68.

[25] Harrison and Baron-Cohen, *op. cit.*, p. 3.

constructed in the imagination, it cannot be attributed to drug use and it is not something that is learnt by the sufferer.[26] Another form of synaesthesia marked out by Harrison and Baron-Cohen and also Laurence Marks is synaesthesia induced through hallucinogenic drugs such as LSD, mescaline or magic mushrooms. This drug-induced confusion between sensory modes appears in some ways to have influenced the imagery intrinsic in the visual music films of west coast filmmakers Jordan Belson, specifically in the nebulous colour diffusions that seem to reach out beyond the screen and wrap themselves around the most primitive areas of our consciousness. Pseudosynaesthesia by association is the third form that they draw attention to. This is a form of acquired synaesthesia in which individuals have learned to make associations between words or letters with colours. They speculate that this form can be attributed to the way that children learn to read from alphabet books in which each letter is assigned a specific colour. The final and most important form of synaesthesia to this thesis is that of metaphor as pseudosynaesthesia. In many of the visual music films under consideration in this thesis such as those by Oskar Fischinger and Norman McLaren, colour is functioning not as direct translation of sound but as an allegory or correspondence. For example in his notes for *Synchromy* (1971) McLaren, who is a documented synaesthete,[27] notes that the colour sound associations he uses are pseudo/culturally synaesthetic associations. The pianissimo (very quiet) notes are represented by soft muted hues while the loud fortissimo notes are coloured in vibrant, contrasting shades of colour.[28]

Sensory correspondences were popular in the Romantic period and were seen as providing a window into the world that lay beyond the senses. The most popular correspondences were between colour and sound. As I pointed out earlier in this chapter, this idea of cross-sensory perception mediated between music and visual art in the early twentieth century, laid the foundations for the development of abstraction. Moreover, a resurgence of these ideas during this period in addition to the development of the film form led to the evolution of these ideas into the ideal expression of visual music – the visual music film. However, to consider abstract or absolute visual music merely as another manifestation of the musical metaphor is to offer an incomplete reading. It is important to delve below the surface of the metaphor and examine more deep-rooted theoretical debates that helped to shape the form.

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[26] *ibid*.

[27] Donald MacWilliams, *The Creative Process*, 1990, Montreal: National Film Board of Canada, [DVD].

[28] Norman McLaren, "Technical Notes on Synchromy," 1971 (Revised 1984), http://www3.nfb.ca/archives_mclaren/notech/NT29EN.pdf, [Accessed: May 21st 2009].

Kandinsky is arguably the artist most associated with the use of musical metaphor in his painting. Rather than merely using the organisational strictures of music he is popularly regarded as a synaesthetic artist, attempting to paint music. Cook writes that "synaesthetic correspondences between colour and music, and more generally between sight and sound, played a major role in the philosophy of art which painter Wassily Kandinsky was developing throughout this period."[29] [30]

Not all of the artists of the modernist period were interested in a musical analogy grounded in intersensory correspondence. The Neo-Plastic painter Piet Mondrian (1872 – 1944) was sceptical of attempts to compare abstract art such as his to music yet his paintings have come to be associated with both the musical analogy in painting and the visual music film. He was, in addition, interested in the unique ability of music to function as a universal language and his theories of neo-plasticism influenced the aesthetics of the films of Eggeling and Richter who were also interested in creating what they referred to as *Universelle Sprache,* their new grammar for a new universal art.

Mondrian adopted the term *neo-plastic* in relation to his own particular form of abstract art.[31] In Neo-Plastic art the basic elements of form are attained through the process of abstraction and "the annihilation of closed form"[32] in favour of the open form of the line combined with the use of primary colours. In his 1994 essay "Neo-Plasticism in music," Art historian Carel Blotkamp asserts that Mondrian believed in the "autonomy and uniqueness of each art"[33] and did not consider abstract art to be "visual music."[34] At the

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[29] Cook, *op. cit.*, p. 45.

[30] It must be noted that Kandinsky himself refuted this in 1913 in an "Autobiographical Note/Postscript:"

> It is fondly maintained that I paint music. This assertion comes from superficial readers of my book *On the Spiritual in Art.* In this book I write at great length, for pages and pages, of the fact that it is an impossible and useless task to attempt to replace one form of art by another, that it is our good fortune that the different arts dispose of fundamentally different means…And finally: I personally am unable to paint music, since I believe any such kind of painting to be basically unattainable […] My aim is: to create by pictorial means, which I love above all other artistic means, pictures that as purely pictorial objects have their own independent, intense life. (Wassily Kandinsky. "Autobiographical Note/Postscript [An untitled essay and "Erganzung"], 1913, Kandinsky: Kollektiv-Ausstellug 1902-12, Munich, p. 344-345).

This statement of intent shows that Kandinsky was bound not by a desire for a synaesthetic correspondence between music and painting but rather an analogy between painting and music.

[31] The term *plastic* is an archaic word for the visual arts but Mondrian's use of the word should be considered distinct from this. In his essay "Neo-Plasticism: The General Principle of Plastic Equivalence" he writes that art should be expressed as purely as possible. This necessitates the erosion of natural form and colour in favour of expression through abstract shapes and colours that are in their purest most basic states. See Piet Mondrian, "Neo-Plasticism: The General Principle of Plastic Equivalence," *Art in Theory 1900-2000: An Anthology of Changing Ideas*, Charles Harrison and Paul Wood (Eds.), 2003, Oxford: Blackwell Publishing

[32] Piet Mondrian, "Pure Abstract Art," *The New Art – The New Life: The Collected Writings of Piet Mondrian*, Harry Holtzman and Martin S. James (Eds.), 1987, London: Thames and Hudson Ltd., p. 223.

[33] Carel Blotkamp, *Mondrian: The Art of Destruction*, 1994, London: Reaktion Books, p. 158.

time of writing his article "Jazz and the Neo-Plastic," which was published in 1927, he did not believe that music had achieved the same results as painting as it clung to "conventional principles and to existing principles."[35] However, he attempted to develop a Neo-Plastic theory that would have a universal validity across the arts. Blotkamp suggests that Mondrian never fully worked out his theories considering Neo-Plastic music and speculates that this was due to the fact he had never possessed the basic knowledge of music that was necessary for an all encompassing artistic theory.[36] Mondrian contradicted his view of music in general as being inferior to painting by claiming that jazz music, which he considered to be free of musical conventions, was comparable to painting due to possessing a "pure rhythm thanks to its greater intensity of sound and to its oppositions."[37] Mondrian considered this "pure rhythm" of jazz to give the illusion of being "unhampered by form" and therefore considered jazz as exemplar of the "universal rhythm" incumbent in Neo-Plastic art.[38] This is evidenced on a more fundamental level in the musical titles of his paintings "Broadway Boogie Woogie" (1942-1943) and "Victory Boogie Woogie" (1942-44), which seem to announce the underlying Neo-Plastic structure governing the composition of the work. This idea of a universal rhythm in music would be drawn on by visual music filmmakers, particularly Eggeling and Richter whose work Neo-Plastic painter Theo Van Doesburg identified as possessing a Neo-Plastic *spirit*,[39] even though the painters associated with the Neo-Plastic movement that eventually gave way to the visual music film did not always ally their work with the musical analogy. Mondrian's ideas of the *pure*, *universal rhythm* of jazz would be exemplified in Norman McLaren's polyrhythmic freeform jazz film *Begone Dull Care* in subsequent years.

The blurring of boundaries between the arts was not limited to painting. Poet Charles Baudelaire (1821 – 67), for example, became absorbed by the great contemporary ideas sublimating in the ether of Romanticism. The Romantics were less concerned with ideas of medium specificity than modernists such as Mondrian. Cook refers to Baudelaire's 1857 sonnet "Correspondences" from his book *Les Fleurs du Mal* (1857) as one of the best "incursions into literature of synaesthesia."[40] Baudelaire wrote many studies of painter Eugene Delacroix's (1798 – 1863) art as he regarded Delacroix as a reflection of himself.

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[34] *ibid.*
[35] Mondrian, "Jazz and the Neo-Plastic," *op. cit*., p. 218.
[36] Blotkamp, *op. cit.*, p. 164.
[37] Mondrian, "Jazz and the Neo-Plastic," p. 218.
[38] *ibid.*
[39] Theo Van Doesburg, 'Abstracte Filmbeelding,' *De Stijl, Vol. 4, No. 5* (1921), *The Cubist Cinema*, *The Cubist Cinema*, Standish Lawder, 1975, New York: New York University Press. pp. 46 – 49.
[40] Cook, *op. cit.*, p.25.

Lockspeiser speculates that Delacroix may not have been accorded the same reputation today had it not been for Baudelaire's studies of him. Baudelaire also felt an affinity with the ideas of Wagner. German philosopher Frederic Nietzsche (1844 – 1900) wrote that Baudelaire was:

> a kind of Richard Wagner without music… He was possibly a man of corrupt taste, but precise and categorical and very sure of himself; in this way he exerts a tyrannical influence over the vague artists of today. As he was the principal prophet and advocate of Delacroix in his time he would now be the principal Wagnerian in Paris. There is much of Wagner in Baudelaire.[41]

Artists and musicians working during this period were aware that they were pursuing the same ideals and invoking the same Romantic *spirit* in their work. Baudelaire himself wrote in 1860 about this affinity with Wagner "What I experienced was indescribable… It seemed to me that I already knew this music…that it was my own music."[42] Lockspeiser sums up Baudelaire's role in capturing the zeitgeist of Romantic thought in the following statement:

> As a critic of painting, literature and music, Baudelaire brought the artistic experience out of an isolated rut peculiar to the practice of one art or another. He aspired to this union of sound and colour in the manner of Wagner in the Gesamtkunstwerk, but it remained an unattainable aspiration.[43]

Like Baudelaire many artists, musicians and poets of the Romantic era aspired to this audiovisual union, through multimedia performances, colour organs and light shows but it was to be the invention of film that truly allowed the visual music filmmakers to attain this Romantic ideal of a total intersensory artwork.

It was not only painters and poets that exploited the idea of intersensory correspondences as a creative source; composers were also interested in the intersection of the senses and the arts. These ideas concerning the universality of music would prove fundamental. Composers such as Olivier Messaiaen (1908 – 92) and György Ligeti (1923 – 2006) have both professed to employing intersensory correspondences in the composition of their music.[44] Arnold Schoenberg (1874 – 1951), in addition to being a composer, was also a practicing painter and member of *Der Blaue Reiter* group (1911-14) associated with Kandinsky. Schoenberg pursued the music and colour analogy more in his

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[41] Friedrich Nietzsche cited in Lockspeiser, *op. cit.*, p. 68.
[42] Charles Baudelaire cited in *ibid.*
[43] Lockspeiser, *op. cit.*, p. 76.
[44] See György Ligeti, *In Conversation: György Ligeti in Conversation with Peter Varnai, Joseph Hausler, Claude Samuel and Himself*, 1983, Da Capo Press; Jonathan W. Bernard, "Messiaen's Synaesthesia: The Correspondence between Color and Sound Structure in His Music" in *Music Perception: An Interdisciplinary Journal*, Vol. 4, No. *1* (Fall, 1986), Berkeley: University of California Press. pp. 41-68

musical work than in his painting.[45] Although more commonly associated with serial composition Schoenberg did in fact begin his career as an *expressionist* composer. The term *expressionism*, which Randolph Schwabe defines as "the concentrated presentation of emotion sought for within the artist's consciousness - an insistence on feeling rather than on the visualisation and reproduction of the external world,"[46] was first used in connection with painting and was an offshoot of Romanticism. Lockspeiser, making a connection between the spirit of Schoenberg's expressionistic work and the work of expressionist painter Edvard Munch, writes:

> Munch belongs in all his terrifying expressions of despair and anxiety to the Schoenberg persuasion. It looks as if Schoenberg must have been aware that the spirit of his music hardly reached the shattering penetrations of Munch. Not even the exhilarating "Pierrot Lunaire" of the masterly orchestral "Variations" approach the truly alarming world introduced by the Norwegian painter. The well-known "Jealousy" painted by Munch in 1887 is nearer the visual ideal of this movement.[47]

In spite of this comparison it is clear that Schoenberg was more drawn to the expressionist painting of the Austrian artist Oskar Kokoschka (1886 – 1980) and Kandinsky than Munch. Cook contends that there are compositional links between "Die Glückliche Hand" (1910-13), Schoenberg's dramatic play set to music, and the tables that place colours in ascending order of emotional intensity in Kandinsky's book *Concerning the Spiritual in Art*.[48] There is a series of colour changes that reflect the psychological states of the characters. Cook remarks that there is a similarity between the sequence of these colours in the crescendo and Kandinsky's table. Both begin with black before moving through intense reds to orange and yellow.[49] Moreover he points out that there is a similarity between the instrumental timbres that Kandinsky associates with these colours and those in Schoenberg's score.[50] Although these similarities cause Cook to speculate whether or not Schoenberg was simply composing with Kandinsky's colour charts on hand, I consider the answer to be more complicated than this. Firstly, the ideas of the colour-music analogy had clearly permeated European society. Secondly, Schoenberg was not unique in his use of coloured lights; Alexander Scriabin was also using coloured light as a supplement to his

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[45] Lockspeiser writes that T.E. Clark compared the anxiety of Edvard Munch's famous painting "The Scream" (1893) to Russian composer Igor Stravinsky's ballet "Le Sacre du Printemps", which first premiered in 1913, but considers it to be a mistaken analogy and proposes that Munch has more in common with Schoenberg.

[46] Randolph Schwabe, "Expressionism," *The Burlington Magazine for Connoisseurs*, Vol, 33, No. 187, Oct., 1918, p. 140.

[47] Lockspeiser. *op. cit.*, p. 132-133.

[48] Cook. *op. cit.*, p. 47.

[49] *ibid.*

[50] See *ibid.* for specific examples of this.

music, specifically in his composition "Promethée, La Poéme du Feu" (1908-10). Finally, Kandinsky's colour system was influenced by Johann Wolfgang von Goethe's colour system and his theory that painting like music required a *thorough-bass.*[51] Kandinsky discusses this in *Concerning the Spiritual in Art*.[52] Lockspeiser labels Schoenberg's "Die Glückliche Hand" and Scriabin's "Promethée, La Poème du Feu" as containing examples of utter failures of synaesthetic colour translation but perhaps he is missing the point. The compositions have more in common with Wagner's idea of the *Gesamtkunstwerk* or the total artwork (which will be considered below) and serve to reinforce the expressionist characteristics of the music.

THE MULTIMEDIA MODEL

The multimedia model is the second dominant model under which the musical analogy has been exploited by the visual music film. Although I asserted that two dominant models exist in relation to the visual music film, synaesthesia and multimedia, these models are not mutually exclusive, and indeed boundaries between both categories are permeable. When attempting to establish a model for multimedia Nicholas Cook draws on the concept of synaesthesia, the other main model for the musical analogy, in order to develop a model for what multimedia is, namely the combined use of media such as film, television, art, or animation.[53] In addition, he is attempting to establish what multimedia is not and posits an argument that it is the differences rather than the similarities between synaesthesia and multimedia that should be taken into consideration when identifying multimedia. While I am not concerned with exploring multimedia per se, I am interested in the conjunction of sound and image in order to create a framework for both identifying and analysing the visual music film. Therefore Cook's discussion of multimedia and its differences with synaesthesia is a useful one.

Central to this idea of multimedia is the idea of *Gesamtkunstwerk* or *the total artwork.* Although widely attributed to German composer Richard Wagner (1813 – 1883), the idea of *Gesamtkunstwerk* was not actually his. In fact, the initial concept of *Gesamtkunstwerk* had little to do with musical theatre. *Gesamtkunstwerk* in its initial

[51] Goethe was referring to a "figured bass" or "thorough bass." Most baroque compositions, with the exception of those written for a solo performer, included a part for a *continuo* instrument such as a harpsichord or organ. The continuo instrument would construct a harmonic accompaniment for the other instruments based on the bass line indicated on the score. For a more thorough explanation of this please see Eric Taylor, *The AB Guide to Music Theory, op. cit.*

[52] See Chapter Six of Kandinsky, *op. cit.*, for examples of this.

[53] Cook, *op. cit.*, p. 29.

formulation was one of total unified artwork, a complete synthesis of art. Under Wagner's dispersal of the idea, specifically in relation to the music-drama of opera, it came to symbolise a mutual interaction between art forms. The arts were *combined* rather than fused to enhance the power of the overarching work. Both the synaesthetic and multimedia models are useful ways of considering the visual music film as individual films can conform to either model depending on the manner in which the music and image is combined within the film's structure.

Not all theorists are positive about an audiovisual culture that attempts to fuse or marry imagery to music. Drawing on composer Pierre Schaeffer's controversial argument from the late 1940s intimating that records and radio can subvert the dominance of vision by allowing us to experience sound as an ontological and aesthetic entity in its own right, Christoph Cox notes that in recent times a new culture has materialised that re-evaluates "the senses and their traditional hierarchy",[54] particularly the dominant privileging of the visual over the auditory. While it is this new culture that has presumably led to the reassessment by organisations such as the C.V.M. of the visual music film as a distinct body of work, Cox expresses disappointment by recent art shows exploring sound. He argues that by combining the visual and aural artists/musicians/filmmakers are offering "an aesthetic appropriation [of] synaesthesia"[55] that diminishes the value of sound as an independent entity. He perceives this as a strategy for retaining sound's dependence on vision, an artistic choice that he finds detrimental to the pursuit of a true art of sound. Despite the fact that this thesis does not focus on the investigation of an independent sound art per se and Cox is expressly referring to a contemporary culture, his argument still holds true for the evaluation of the early visual music films emerging in a period so bound up in ideas of medium specificity by modern artists such as Mondrian. Cox's discussion of the dominance of the visual in synaesthetic art is, therefore, a useful starting point when attempting to discuss visual music as a form of multimedia.

Nietzsche, like Cox, was insistent that sound and vision should be confined to separate distinct realms with the relationship between them being considered only through the discourse of metaphor or translation and not as a literal representation. Nietzsche and Cox are therefore advocating an audiovisual translation of music grounded in a multimedia model, which is arguably what is at the heart of many visual music films. But how can one

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[54]Christoph Cox, "Lost in Translation: Sound in the Discourse of Synaesthesia," *Artforum Magazine*, October 2005, http://hogarcollection.com/press_lost_in_trans.htm, p. 3, [Accessed: 3rd February 2009].

[55]*ibid*.

discern what is synaesthetic or pseudosynaesthetic and what can be considered to be multimedia? Theoretically all visual music films can be considered to be a form of multimedia or *Gesamtkunstwerk* as synaesthesia is such a personal and idiosyncratic idea.

One of the best discussions of the connection between film and music can be found in David Bordwell's article "The Musical Analogy."[56] Although Bordwell is explicitly comparing the narrative film to a musical composition, it remains one of the best incursions into how a filmic text can possess musical qualities. Interestingly Bordwell suggests that the use of the musical analogy by cineastes was a way of *justifying* the medium of film as "worthy of intellectual notice" in an era of intellectual snobbery.[57]

Russian filmmaker Sergei Eisenstein was perhaps the earliest theorist to attempt to formulate a cohesive theory of cinema. In his 1943 book *The Film Sense* Eisenstein discusses colour correspondences in the arts. For Eisenstein different media could relate to one another by virtue of shared qualities but they still remain distinct entities. This is in contrast to Wassily Kandinsky, who I made reference to earlier in this thesis and who, is popularly regarded as removing all specificity of media by integrating the common abstract virtues of the media and eliminating all else. Under this system, Schoenberg's concept of "Klangfarbenmelodie" (tone-colour melody) in his book *Theory of Harmony*[58] is more obviously aligned with Eisenstein's theories of audio-visual montage. Olivia Mattis writes that this concept has been "misinterpreted to mean a melody comprising successive tone colours, whereby each successive musical tone is to be played by a different instrument."[59] She, like musicologist Alfred Cramer, believes that he had a vertical and not a horizontal construct in mind. This notion of a vertical construct is analogous to Eisenstein's theories of vertical montage. American poetic filmmaker Maya Deren has also written about a vertical construct in poetic film that is derived from poetry.

Eisenstein uses the analogy of an orchestral score to illustrate his ideas on editing. A musical score is composed of many staffs consisting of five parallel lines, each corresponding to a particular instrument or set of instruments. The music for each staff develops horizontally unfolding note-by-note over a set period of time but each staff integrates on a vertical level too. If one were to pick up an orchestral score one would see

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[56] David Bordwell, "The Musical Analogy" in *Yale French Studies, No. 60, Cinema/Sound*, 1980, Yale University Press.

[57] *ibid.*, p. 141.

[58] Arnold Schoenberg, *Harmonlelehre*, English, *Theory of Harmony*, Roy E. Carter (Trans.), 1978, London, Faber: Faber Music.

[59] Olivia Mattis, "Scriabin to Gershwin: Colour Music from a Musical Perspective," *Visual Music: Synaesthesia in Art and Music since 1900*, 2005, London: Thames and Hudson, p. 261.

the staves stacked parallel one above the other, bound together with vertical bar lines traversing the length of the page. These bar lines divide the music into metrical measures of time and ensure that the instruments are co-ordinated temporally and visually. Eisenstein encapsulates the importance of this concept of horizontal and vertical integration in the musical score:

> Through the progression of the vertical line, pervading the entire orchestra, and interwoven horizontally, the intricate harmonic musical movement of the whole orchestra moves forward. [60]

An audio-visual score works on the same principles. The only difference is that we must add a new instrument to the canon; a staff of visuals that relate to the music and vice versa. This tenet can be clearly illustrated by looking at modern digital non-linear editing systems such as "Final Cut Pro" or "Avid," which provide the editor with layered visual and audio tracks that coalesce vertically and horizontally just like the orchestral score.

Eisenstein invokes another musical analogy by employing the term polyphony to describe shots simultaneously advancing while still maintaining an independent melody and contributing to the compositional whole. This Platonic ideal, also present in Mondrian and Deren's ideas of medium specificity, is important to bear in mind as it feeds into ideas of harmony, specifically those of John Whitney that we will encounter in subsequent chapters. Many visual music filmmakers such as Richter, Eggeling and John Whitney explicitly use this concept to orchestrate the imagery of their films according to musical structures. This idea of polyphony is what Cook is alluding to in his model of multimedia, particularly when he uses it to investigate Schoenberg's "Die Glückliche Hand." It is also a concept employed by visual music filmmaker John Whitney as a compositional principle of his work.[61]

French composer and audio-visual theoretician Michel Chion however, adopts a contradictory stance to Eisenstein theories of audio-visual counterpoint when discussing vertical integration in film. In *Audio-Vision: Sound-on-Screen* he argues that it is not counterpoint to which Eisenstein is referring but the musical concept of harmony. He writes:

> The arrival of sound in the late twenties coincided with an extraordinary surge of aestheticism in silent film, and people took passionate interest in comparing cinema with music. This is why they came up with the term counterpoint to designate their notion of the sound film's ideal state as a cinema free of

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[60] Sergei Eisenstein, *The Film Sense*, Jay Leyda (Trans.), 1943, London: Faber and Faber, p. 62.

[61] See John Whitney, *Digital Harmony: On the Complementarity of Music and Visual Art*, 1980, Peterborough, New Hampshire: Byte Books/A. McGraw Publication.

redundancy where sound and image would constitute two parallel and loosely connected tracks, neither dependent on the other.[62]

Under the auspices of Western classical music, counterpoint (polyphony) occurs when one melody is concurrently accompanied by other related melodies.[63] Chion demarcates this from *harmony* by locating the idea of counterpoint in the *horizontal* dimension unfolding temporally and reading from left to right on the musical manuscript page. Harmony on the other hand, although closely associated with counterpoint, concerns the realm of the vertical and is concerned not with the individual melody being played out but the relation of each individual note to the other notes being heard at the same moment in time much in the same way that a musical chord is played. For example, if one depresses the keys of C, E and G, on a piano the chord of C Major is sounded. The three individual notes, laid out vertically, one above the other on the musical staff, have integrated to form a triadic chord. Although a differentiation has been made between these two musical dimensions, horizontal and vertical counterpoint and melody are usually combined in western classical music much like the *x* and *y* axes on a map necessary for us to read directions. Without looking at both aspects, we are unable to accurately pinpoint the position that we are seeking.

Chion asserts that even if audiovisual counterpoint does exist it does so in form different to that of musical counterpoint. This is because unlike musical counterpoint, which uses the same aural sensory material, sound and image fall into different sensory camps.[64] Not only this it also dictates, as Eisenstein theorised, that the soundtrack running parallel to the visual track is maintaining its own individual formal force. Chion proposes that this is an unworkable fallacy and what Eisenstein is actually referring to is "dissonant harmony"[65] as films tend to have points of "momentary discord between the image's and sound's figural natures"[66] rather than a continuously heterogeneous aural or visual line. Chion is wary even of the use of the musical analogy of harmony, as the term does not make ample provision for the intricacies of the audiovisual form either. It would appear that he is regarding any musical analogies as an inadequate parallel to demonstrate the interdependence and dialectical tension in their relationship.[67]

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[62] Michel Chion, *Audio-Vision: Sound-On-Screen*, (Edited and translated by Claudia Gorbman with a foreword by Walter Murch), 1994, New York: Columbia University Press, p. 36.
[63] Taylor, *op. cit.*
[64] Chion, *op. cit.*, p. 36.
[65] *ibid.*, p. 36-37.
[66] *ibid.*
[67] *ibid.*, p.37.

Chion's argument is referring to narrative cinema and television but does offer the example of music video as a film typical of having horizontal freedom, in which there is no exact correlation between the parallel image and sound tracks. Music videos have a "perceptual solidarity, marked by points of synchronisation that occur throughout."[68] He asserts that these synch points provide the "harmonic framework of the audiovisual structure."[69] This type of "perceptual solidarity" is what creates the synchronisation in many of Fischinger's visual music films.

For the examination of visual music compositions Eisenstein's theory of horizontal and vertical integration is useful due to his contention that the musical framework is just as crucial as that of the visual. This does not automatically mean that we should discount Chion's theories. Visual music films such as *Kreise* or *Motion Painting No. 1* (1947) by Oskar Fischinger do not synchronise frame-by-frame with the visuals on screen but via the "points of synchronisation" to which both Chion is referring. Eisenstein also makes reference to this idea:

> In the more rudimentary forms of expression both elements (the picture and its sound) will be controlled by an identity of rhythm, according to the content of the scene. This is the simplest, easiest and most frequent circumstance of audio-visual montage, consisting of shots cut and edited together to the rhythm of the music on the parallel soundtrack. Whether movement exist in these shots is not of serious consequence. If movement happens to be present, the only demand upon it is that it conforms to the rhythm fixed by the parallel track.[70]

He continues:

> From all the plastic means of expression at our disposal we can surely find those whose movement harmonises not only with the movement of the rhythmic pattern, but also with the movement of the melodic line. [71]

While I do not mean to discount Eisenstein's useful theories of counterpoint, especially due to the overt appropriation of the term from music by the visual music filmmakers, Chion's ideas of a harmonic structure are also useful, particularly his idea that sound and image occurring simultaneously have a different effect to those occurring separately.

The multimedia model is a useful one with which to consider the visual music film as not all of these texts follow the same method of synchronisation, audiovisual integration or aesthetic. Some films such as the visceral visual music films of Jordan Belson are

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[68] *ibid.*
[69] *ibid.*
[70] Eisenstein, *op. cit.*, p.68.
[71] *ibid.*

pseudosynaesthetic or move to be synaesthetic or demonstrate intersensory correspondences. In the case of the films of James Whitney, who was working contemporaneously with Belson, the soundtracks and imagery do not integrate yet still affect the audience when joined.

Indeed, I would posit that all visual music films can be considered as forms of multimedia or *Gesamtkunstwerk* due to the subjectivity of synaesthesia. Even if a visual music film is composed by a true synaesthete wishing to replicate the images that they perceive in relation to a specific musical composition or vice versa, synaesthesia is so particular and specific to individual sufferers that there is no way that an audience could experience in exactly the same manner as the creator. As Nicholas Cook points out, multimedia lies in the perceived interaction of media[72] so by virtue of some form of interaction existing between the image and soundtracks of the visual music film, this would indicate that the visual music film is an exemplar of multimedia. However, not all visual music films have a musical accompaniment. *Symphonie Diagonale* by Viking Eggeling (which I will discuss below) and *Radio Dynamics* by Oskar Fischinger were conceived to be screened silently, yet both films function as visual music films and possess expressly musical characteristics. Bearing in mind, therefore, this diversity of aesthetics and forms in the visual music film, this thesis will appropriate aspects of both synaesthetic and multimedia approaches when examining individual texts.

MOTION PAINTING

A key approach for film scholars attempting to establish an identity for visual music films is to expose the origins of the form in *motion painting*. This approach grounds these films in a painterly tradition and therefore examines them from the perspective of visual art. Although these authors do not explicitly refer to the films as *visual music films* or indeed, discuss them in musical terms, they are referring to a body of work that I have understood as *visual music* and therefore needs to be included in a survey of literature in order to expose the historical origins of these films and to understand the visual aesthetics.

Visual music films have predominantly been understood from a historical perspective in the field of film studies. Many theorists have looked at visual music films or animations through their place in the wider context of the avant-garde. As I made reference to earlier, Sitney, in his classic survey of post-war American avant-garde cinema,

[72] Cook, *op. cit.*, p. 34.

Visionary Film: the American Avant-Garde, "visual music" positions films under the umbrella term of "graphic cinema."[73] Sitney writes that graphic cinema was a vital alternative to subjective cinema. Sitney, like theorists such as Standish Lawder, places this body of work into a lineage of films descended from Surrealism and Cubism but his engagement with the films of Hans Richter, Viking Eggeling, Harry Smith and Jordan Belson focuses on their historical origins and place in the history of avant-garde film without attending to the overt musicality of these films. We gain knowledge of their historical place in the avant-garde and their origins in painting but little in the way of understanding their work in relation to music.

The same can be said of A.L. Rees in his book *A History of Experimental Film and Video*.[74] He too includes a chapter on visual music films, which he entitles "The Absolute Film." Rees does not examine the absolute films that he writes about in musical terms despite his overt acknowledgment of their relationship to music by virtue of collecting them under the umbrella term of *absolute*, a term derived from *absolute music*, which will be explored in detail in the following chapter. While he acknowledges that the filmmakers he is examining, Viking Eggeling, Hans Richter, Walter Ruttmann and Oskar Fischinger were aspiring to a state of visual music and he does emphasise the importance of the musical analogy to their work he, again, does not explicitly state what makes them exemplars of visual music or discuss their musicality.

Malcolm LeGrice also adopts this approach in his influential book *Abstract Film and Beyond*.[75] Contending that "there is no inevitability in cinema's history," he asserts that it is the result of "needs, priorities, social and economic pressures."[76] This places him in opposition to Hans Richter, Norman McLaren and the other visual music filmmakers who viewed the introduction of movement to the still image as inexorable in the modern age in the wake of the industrial revolution. Further to this LeGrice does not consider the films that I am examining as visual music films but considers them as drawing inspiration from the "state of contemporary non-figurative painting"[77] rather than music. LeGrice regards their movement and time structures to be drawn from music but, as in the case of Lawder and Sitney, he maintains that the visual aspects are drawn from painting and never delves into the musical qualities of this body of work. This acknowledgement of the debt

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[73] See Chapter 7 of Sitney, *op. cit*.

[74] A.L. Rees, *A History of Experimental Film and Video: From the Canonical Avant-garde to Contemporary British*, 1999, London: BFI Publishing.

[75] LeGrice, *op. cit*.

[76] *ibid*., p. 9.

[77] *ibid*., p. 33.

that these films pay to the visual structures of Cubism and Neo-Plasticism is both valid and accurate but LeGrice's foregrounding of the visual imagery is at the expense of the musical characteristics.

Unsurprisingly it is the work of Viking Eggeling, Hans Richter and Walter Ruttmann, arguably the earliest pioneers of the visual music film, that have been discussed in particular as *motion paintings.* All three had been painters and their initial foray into film was literally an extension of both the visual aesthetics and philosophical concerns that they had been exploring in their paintings. Eggeling and Richter's efforts in particular developed from a series of scroll paintings that they were undertaking in collaboration in the post-war period. Both became interested in introducing the element of temporality into their work by painting evolving series of shapes, each bearing a relationship to the adjacent shape. By structuring the paintings in the form of scrolls, which due to their length forced the viewer to readjust their field of vision in order to comprehend the shapes, Eggeling and Richter were not only determining the order in which the viewer interprets the shapes but were also introducing the attributes of rhythm and temporality into the viewing process. It was no great stretch for both artists to adapt these elements to the film frame.

In his classic text *The Cubist Cinema*, Standish D. Lawder firmly places the work of Eggeling, Richter and Ruttmann into a film practice that stems from a fine art tradition that includes scions of the avant-garde Wassily Kandinsky, Pablo Picasso and Fernand Léger among its number.[78] Due to the origins of their work in a fine art practice, it was a natural and valid entry point for a discussion of their film work. However, by making the connection between the works of Eggeling, Richter and Ruttmann in terms of their origins in painting he is, like Le Grice, Sitney and Rees, foregrounding the visual aspects of their work and only taking into account one aspect of their films at the expense of the musical qualities.

Although Lawder is arguably the most prominent author to discuss early visual music films as essentially moving paintings, he was not the first person to do so. In his 1952 article "Cineplastics: The Fine Art of Motion Painting," animator Robert Bruce Rodgers defines motion painting as "the expression of an artist's intention in the form of an organised 'river' of light and form – more or less abstract, more or less independent of or integrated with other elements and arts."[79] Although he does not mention particular media in this text, for Rodgers, motion painting is fashioned from the union of painting and

[78] Standish D. Lawder, *The Cubist Cinema*, 1975, New York: New York University Press.

[79] Robert Bruce Rodgers, "Cineplastics: The Fine Art of Motion Painting," *The Quarterly of Film, Radio and Television.* Vol. 6 No. 4., Summer, 1952, p. 375.

film with little in the way of an official identity or concrete terms of reference much like the visual music film, which, as this thesis has so far demonstrated, has been claimed by many different factions. Interestingly, considering his stance on the *motion painting* as a succession of moving paintings, he writes that the term *painting* has a "descriptive" rather than literal meaning since the image presented on screen is a projected image of film like any motion picture.[80] Many of the visual music makers such as Stan Brakhage, Len Lye and Norman McLaren did literally paint on each film frame. Were one to examine a single frame of a film such as *Night Music* (1986) by Stan Brakhage, one would determine that each hand-painted frame has its own discrete image that looks not unlike the abstract expressionist paintings of Jackson Pollock infused with the celestial lights of the aurora borealis.

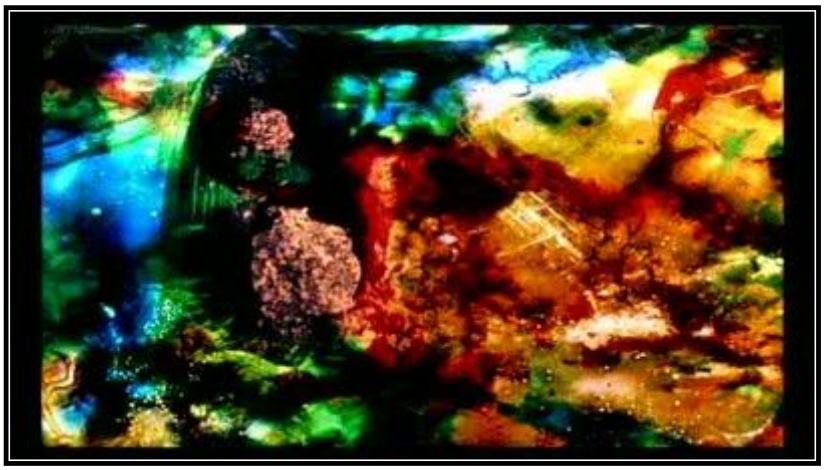

FIGURE 1.1: STILL IMAGE FROM STAN BRAKHAGE'S 1986 FILM *NIGHT MUSIC* DEMONSTRATING THE PAINTERLY QUALITY OF THE FILM. HTTP://SHORTCUTCINEMA.BLOGSPOT.COM/2009/08/AVANT-GARDE-NIGHT-MUSIC-1986-STAN.HTML.

Rodgers, like Lawder, discerns a motion-orientated line flowing from Impressionist painting, through post-impressionism, cubism, expressionism and plastic-abstractionism to the composition of motion paintings or works of art that are organised in motion and time. More importantly, he points out that this evolutionary line is distinct and separate from that of narrative cinema and at times refers to "motion paintings" as "cineplastic composition."[81] I am not sure how far I concur with this but this argument is necessary in order to consider the moving image work by Richter and Eggeling as works of *motion painting* or an extension of painting rather than discrete visual music films.

He qualifies this by listing some factors of modern painting that lead to the expression of cineplastics; the entire picture plane as an object, light, form, colour, pattern,

[80] *ibid.*, p. 375.
[81] *ibid.*, p. 379.

space, depth time, pace, interval, movement types, sequential duration and length.[82] The abstract plastic films of visual music film pioneers Hans Richter, Viking Eggeling and Walter Ruttmann are in this tradition of motion painting. As this chapter is constantly reiterating Richter and Eggeling's films in particular came from a desire to imbue their still formal paintings and drawings with a kinetic temporal quality most typically found in music.

Rodgers additionally draws on concepts of plasticity in art as postulated by French art historian and critic Élie Faure (1873 – 1937), who first coined the term *cineplastic* in his influential essay "The Art of Cineplastics" in relation to the film form which was in its infancy at his time of writing. Faure was excited by the new form of film envisaging it as the successor to what he viewed as the dead art of painting, yet he still situates film in a *plastic* fine art tradition writing that it is a plastic art first and a psychological art second.[83] In her article "The Prescience of Élie Faure" Margaret C. Flinn writes that motion was integral to Faure's concept of plasticity but that he was explicitly rejecting attempts by writers like Robert Bruce Rodgers who would later try to reduce the concept of plasticity to only the material aspects of an art form.[84] Faure, like Mondrian, is suggesting that the idea of "l'esprit de l'art plastique"[85] should be bestowed on other forms of movement whether that is the rhythmical movements of a group of gymnasts or a military drill,[86] the type of movements reminiscent of military drills present in the choreography of musicals by Busby Berkeley during the 1930s. Flinn states that Faure, in his use of metaphors involving movement ("architecture en mouvement")[87] was arguing that time was essential for motion to transpire and therefore elicit an emotional response from the viewer. This concept could also be applied to music, which is also a time-based art that educes an emotional response. According to Flinn, Faure considered the ability of film to emotionally and spiritually move the audience to be inherent to his concept of "cineplasticity."[88] Again, these are values intrinsic to music and are especially apparent in the work of many of the visual music filmmakers. Although Faure never explicitly used the words *visual music* in relation to the early avant-garde films he does write that

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[82] *ibid.*, p. 380.

[83] Élie Faure, "The Art of Cineplastics," *Film: An Anthology*. Daniel Talbot (Ed.), 1975, Berkeley: University of California Press, p. 5.

[84] Margaret C. Flinn, "The Prescience of Élie Faure," *SubStance*, No. 108, Vol. 34, No. 3, 2005, p. 50.

[85] Élie Faure cited in Flinn *op. cit.*, p. 50.

[86] *ibid.*, p. 51.

[87] *ibid.*

[88] *ibid.*, p. 52.

cineplastics has the ability to embody what only music had thus far been able to capture, the idea that the "feeling of the artist creates the art."[89]

Rodgers makes a more overt analogy between music as an organised stream of tones and a *motion painting* as an "organised continuity of light and form."[90] The lines, forms, or colours are used to express a mood or aesthetic feeling like that expressed by music in abstract rather in specific terms, which is similar to Faure's contention that a cineplastic composition could express the emotion of the creator. Although Rodgers makes an explicit analogy with music this does not mean that he regards the music or sound of these films as having any weight or correspondence with the picture. It would seem that Rodgers, by merely referring to visual music films as "motion paintings," is like Lawder and Faure privileging the directly visual. Interestingly though he does concede that motion painting as an art form reaches the highest point in its development when a new third quality is attained. Rodgers is not explicit in his explanation of what this new third quality is. He writes "the mere addition or sum, the "interpretation" or accompaniment of one art form by or to another, does not attain the synthesis sought in motion painting."[91] This reflects a wider thought process that was present in fine art in the early twentieth century. In *On the Spiritual in Art*, Wassily Kandinsky presents a similar philosophy:

> The creation of the individual forms are related to each other in various combinations while remaining subordinate to the whole composition. Thus, many objects (real, or possibly abstract) are subordinated within the picture to a single overall form and altered to make them compatible with this form, which they comprise. In this case, the individual form, which mainly serves the overall form of the composition, can retain little of its own personal sound and should be regarded principally as an element of that form. ….Here the first task – the composition of the whole picture – is pursued as a definite goal.[92]

Both Rodgers and Kandinsky would seem to be purporting then that in order to achieve the greatest maturity of expression, a synergy that is greater than the sum of the constituent elements of image and sound must be achieved. This third synergistic quality can be interpreted as the spiritual or emotional value of the "motion painting," the *sublime* of Enlightenment philosophers Immanuel Kant (1724 – 1804) and Edmund Burke (1729 – 97), that Faure considered so important. This third quality could be considered the quality

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[89] Élie Faure, "The Art of Cineplastics," *Film: An Anthology*, Daniel Talbot (Ed.), 1975, Berkeley: University of California Press, p. 9.

[90] Rodgers, *op. cit.*, p. 380.

[91] *ibid*., p. 376.

[92] Kandinsky, *op. cit*., p.167.

that allows visual music films to transcend the mere label of *motion painting* to approach the state of music.

Rodgers, Lawder and Faure's view that the *motion painting* was an inevitable and natural progression for modern painting was not the only view on the subject. In her article "Motion Painting: 'Abstract' Animation as an 'Art Form'" Lorettann Devlin Gascard refutes this idea by claiming that putting abstract painting into cinematic motion leads to a functional dilemma.[93] The abstract film or animation produced lies floundering for an aesthetic identity and is treated as an illegitimate child of either cinema or painting. This is the position in which the visual music has often found itself. By imbuing images with motion, artists are responding to a natural kinetic urge but by doing this visual music films or abstract animations are responding twice to this desire with a technical answer supplied by cinema and an aesthetic answer supplied by the equivocacy of abstract images.[94] Gascard views this as leading to an ambiguity of non-representation. She posits that there is an incompatibility between representational painting and motion leading to a functional impediment as painting relies on its intention of stability for its dynamism.[95] In essence, this means that the quality of movement or dynamism is drawn from the ambiguity of the abstract images. The moment that an abstract image moves it can potentially be read as a figure. The element of movement has served to formulate and define space and potentially imply a narrative.[96] There is a natural tendency for us to anthropomorphise abstract images, to see or impose human characteristics on moving lines and shapes, to imagine that they are dancing or fighting or interacting. This is especially apparent in more playful visual music films as Walter Ruttmann's *Lichtspiel Opus I – IV* and *Dots* (1940) and *Loops* (1952) by Norman McLaren. When attempting to analyse these films I found myself projecting anthropomorphic qualities onto the abstract dancing shapes once there was a semblance of a physical interaction between the moving figures. The temptation is always there to understand and describe them in terms of characters drawn from traditional narrative cinema. This can be attributed to the *quality* of the movements involved as it is difficult to anthropomorphise the images in more densely layered texts such as *Night Music* or the *gaseous* visual music films of Jordan Belson such as *Samadhi* (1964).

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[93] Lorettann Devlin Gascard, "Motion Painting: 'Abstract' Animation as an Art Form" in *Leonardo, Vol. 16, No. 4,* Autumn, 1983, p. 293.
[94] *ibid.*
[95] *ibid.*, p. 294.
[96] *ibid.*

It is questionable however, whether or not this propensity to understand the images present in the abstract visual music film in anthropocentric terms negates the objectivity of the abstract images. The author is obviously suggesting that the addition of cinematic movement leads to the dissolution of multiple readings of the abstract moving images that might otherwise be read in a static painting due to its ambiguous nature. However, it could conversely be suggested that bestowing movement on a still image is giving it a power of expression, a point with which Rodgers concurs. He proposes that the cineplastic qualities of motion paintings allow them to be screened more repeatedly than other film forms in much the same way as a musical composition can be replayed.[97] Faure also makes this point writing:

> Like painting, moreover – and more completely than painting, since a living rhythm and its repetition in time are what characterise cineplastics – the later art tends and will tend more every day to approach music and the dance as well. The interpenetration, the crossing and the association of movements and cadences already give us the impression that even the most mediocre films unroll in musical space.[98]

This would suggest that the form of "motion painting" readily lent itself to the representation of music.

The earliest recorded foray into visual music film was by painter Leopold Survage (1879 – 1968). Survage was a Cubist painter who like Eggeling and Richter wished to expand the dynamism and sense of rhythm that he had been exploring in his painting into film. Although Survage never actually completed a visual music film he laid out his plans for an audiovisual composition in his project *Le Rythme Colore* (1913). Despite explicitly stating in a signed manifesto that the origins of his new project was in his painting practice[99] he fully intended his project to be an autonomous art form that was not merely functioning to illustrate or interpret music. He writes:

> Coloured Rhythm is in no way an illustration or an interpretation of a musical work. It is an art in itself, even if it is based on the psychological facts as music.[100]

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[97] Rodgers, *op. cit*., p. 379.

[98] Faure, *op. cit*., p. 6.

[99] "I will animate my painting, I will give it movement, I will introduce rhythm into the concrete action of my abstract painting, born of my interior life; my instrument will be the cinematographic film, this true symbol of accumulated movement.... I am creating a new visual art in time, that of coloured rhythm and of rhythmic colour." Leopold Sturzwage (Leopold Survage). "Colour, Movement, Rhythm," *Experimental Animation: An Illustrated Anthology*, Robert Russett and Cecile Starr (Ed.s), New York: Van Nostrand Reinhold Company, p. 36.

[100] *ibid.*, p. 22.

Survage envisaged his film as a series of separate sequences of approximately three minute duration. As a three minute film requires between 2,000 – 3,000 drawings Survage created the main outline of the sequences and intended for a draftsman to complete the in between drawings. Even though the film was never realised due to the complications of making a colour film during Survage's period of working, his intentions for the film can be discerned from the 71 remaining gouache drawings that he completed for the outline. One can see the successive transitions between shapes and forms that he intended to occur. Survage writes that it is these transitions over time that allows for an analogy with music:

> On its analogy with music. It is the mode of succession in time which establishes the analogy between sound rhythm in music, and coloured rhythm – the fulfilment of which I advocate by cinematographic means. Sound is the element of prime importance in music… The fundamental element of my dynamic art is coloured visual form, which plays a part analogous to that of sound in music.[101]

Lawder points out that Survage's work was close to that of Kandinsky and Delaunay who also used music as their model for an autonomous art.[102] Like both of these artists Survage did not intend for an exact correspondence between specific notes and colours or emotional overtones. Richter, Eggeling and Survage's explicit connection between their fine art film practice and his vision for a visual music film demonstrates that the discussion of their work as *motion paintings* by authors such as Lawder, Faure, Rodgers and Gasgard is a valid and useful one. Although the focus of their writing is on the visual aspects of the body of work under debate, it serves to place the aesthetics of the visual music film into a broader historical context. It is my intention to combine aspects of this approach with an approach that places a greater emphasis on the musical qualities of the visual music films.

[101] Survage, *op. cit*.
[102] Lawder, *op. cit*., p. 36.

THE MUSICALITY OF SYMPHONIE DIAGONALE

As this chapter has already suggested Viking Eggeling's only completed silent film *Symphonie Diagonale* has historically been read a number of ways. It has been read as belonging in the lineage of *Cubist Cinema* by academic Standish Lawder. It has been considered as a work of *absolute* film by A. L. Rees. Author and filmmaker Malcolm LeGrice has understood it as an example of abstract film. Cecile Starr and Robert Russett view it as a significant work of experimental animation. It has been classified and read as a quintessential work of *Dada* by authors such as Thomas Elsaesser, Malcolm Turvey, Phillippe-Alain Michaud and Hans Richter. Moreover a DVD entitled *Cinema Dada* issued to mark a Dada exhibition at La Centre du Pompidou in Paris includes Eggeling's film as part of the Dada canon of films. By virtue of the film's heritage in scroll paintings, the film could also be considered to be an example of motion painting. Yet despite all of these divergent and equally valid claims on *Symphonie Diagonale*, a convincing case can be waged for its position as a work of visual music.

This section will attempt to make a case for this position by considering the facets of the work that allow it to be read as a musical text. This analysis is comprised of two parts. The first part will explore, through close textual analysis, how the recurring visual motifs in the film function as analogues to motifs in music and also how Eggeling uses expressly musical strictures such as *counterpoint* to orchestrate his images. The second part will explore the wider formal musical structure of the film and question whether or not it exemplifies traditional "symphonic" form or whether a better comparison may be made with the serial music of Arnold Schoenberg. Finally this section will draw on the three dominant approaches to investigating the visual music film established earlier in this chapter in order to formulate a more comprehensive methodology with which to examine this body of work.

FIGURES AND MOTIFS

In *Symphonie Diagonale* Eggeling takes the line as his most basic building block, or note, and works on the orchestration of relationships between these lines, which are arranged in contrapuntal pairs of opposites based on the mutual attraction and repulsion of binary forms. In music the principle of counterpoint can be taken to literally mean "point

against point" or, more generally, "melody against melody."[1] In *Symphonie Diagonale* Eggeling appropriates this musical concept and pits one visual motif against in the other in a controlled reciprocal but opposite movement. If a figure moves up screen, the next figure, a mirror of the previous, will move down screen.

In music, a motif is a short distinctive musical idea. It functions as an elemental constituent of melody and recurs throughout a composition, often with variation. One of the best known and celebrated examples of this is found in the motif which opens Beethoven's 5th Symphony. *Symphonie Diagonale's* visual motifs are formed from simple lines and curves. The dominant motifs are:

1. A harp-like figure recurring throughout the film with variations. There are two main variations on this theme (see figure 1.2).
    i. One harp grows and moves to the centre while a larger one, in a reciprocal movement, recedes and vanishes.
    ii. One harp recedes while another one grows. It almost appears as though the receding shape is pulling the prongs of the emergent shape alone with it like a contracting bicep muscle in the front of the human arm elongating the triceps at the back of the arm as it stretches.

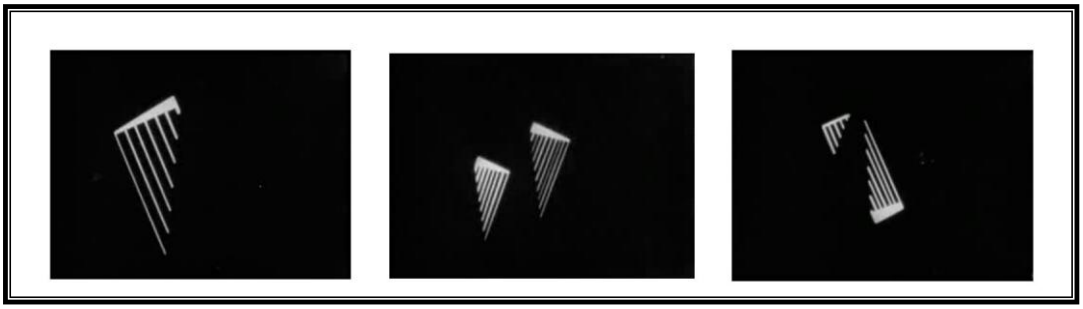

FIGURE 1.2: EXAMPLES OF VARIATIONS ON THE HARP FIGURE FROM *SYMPHONIE DIAGONALE* (1921-24). IMAGES FROM VIKING EGGELING, *SYMPHONIE DIAGONALE*, CINEMA DADA [DVD], 2005, RE:VOIR.

There are many other minor variations on these two main harp motifs, with modifications in the size, shading and duration of the figures. These changes could be considered to serve as a visual equivalence of musical crescendo (music getting louder) and diminuendo (music getting quieter).

[1] Taylor, *op. cit.*, p. 126.

2. Many variations on a comb like figure appear in the film. Sometimes the combs move in jumping movements, attracting and repelling other combs (see figure 1.3). At other times the combs take on anthropomorphic characteristics resembling stylised hedgehogs scurrying up and down the screen. The figure of the comb is one of the most utilised in *Symphonie Diagonale*. They occur alone or attached to other more complex shapes as though they are a melody contributing to the polyphonous (multi-melody) counterpoint.

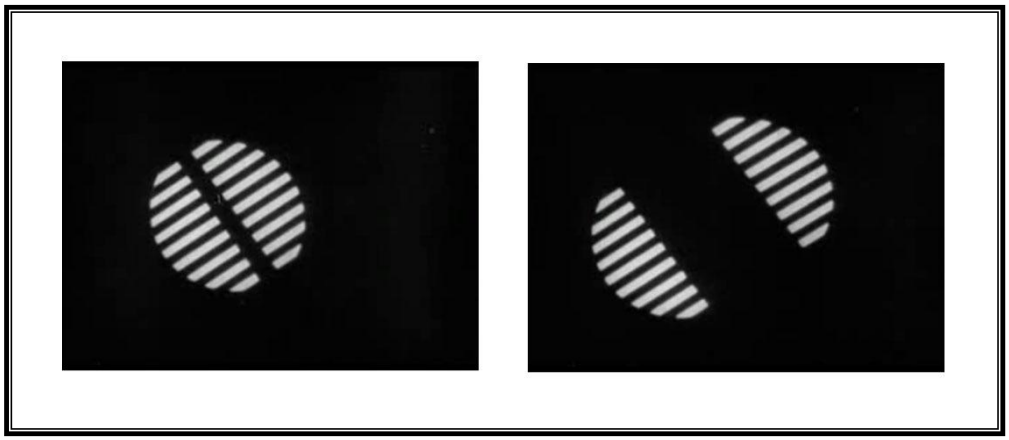

FIGURE 1.3: VARIATIONS ON THE COMB FIGURE FROM *SYMPHONIE DIAGONALE* (1921-24). IMAGES FROM EGGELING, *SYMPHONIE DIAGONALE* (1921-24), *OP. CIT*.

3. Curvilinear figures that grow and contract from harp like figures occur both homophonically (single melody) and in more melodic counterpoint with other figures (see figure 1.4). Visually the figures look like variations on trails disappearing from shooting stars.

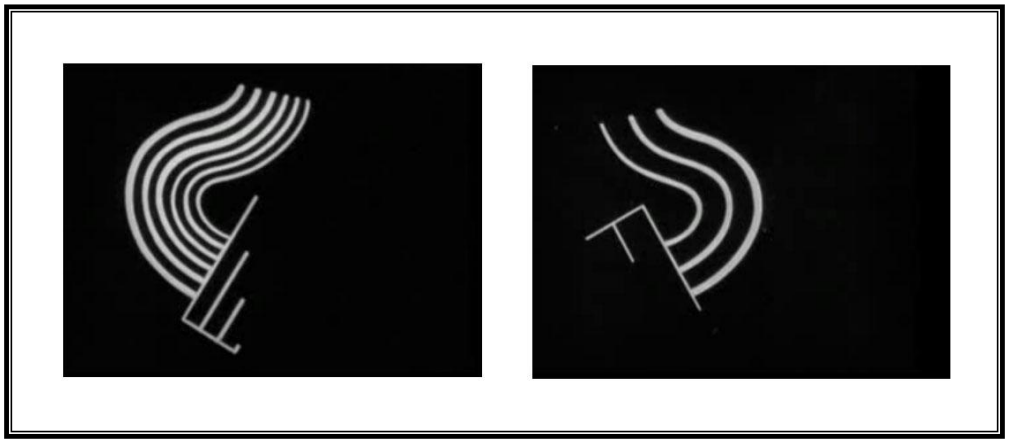

FIGURE 1.4: VARIATIONS ON THE SHOOTING STAR FIGURE FROM *SYMPHONIE DIAGONALE* (1921-24). IMAGES FROM EGGELING, *SYMPHONIE DIAGONALE* (1921-24), *OP. CIT*.

As the film progresses the imagery becomes increasingly complex echoing the development of a symphony. The individual elements of these compositions are in a constant evolution; growing, transforming and disappearing until the end of the figure (see figure 1.5).

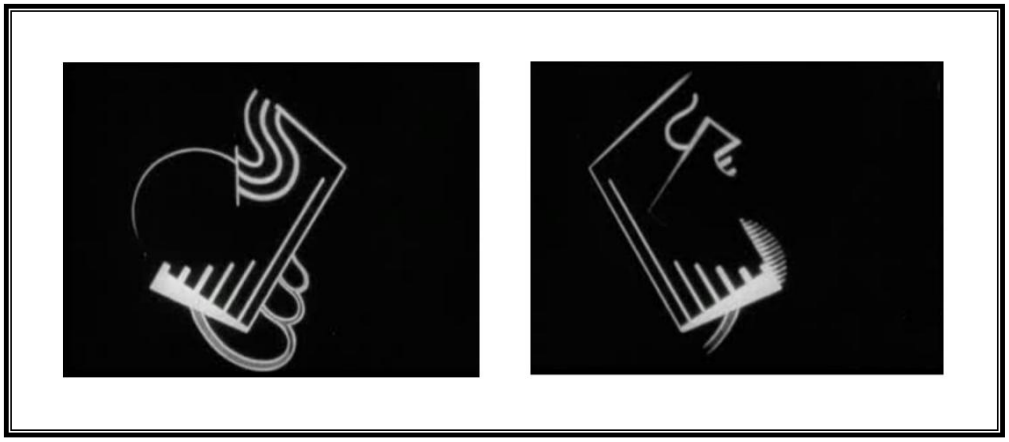

FIGURE 1.5: COMPLEX MOTIF FROM *SYMPHONIE DIAGONALE* (1921-24). IMAGES FROM EGGELING, *SYMPHONIE DIAGONALE* (1921-24), *OP. CIT*.

MUSICAL FORM

The title of the film is the first indication of a musical structure. As with the paintings of Klee, Turner and Newman, Eggeling incorporates the nomenclature of music into the title to make explicit the connection between the structure of film and music. The first movement of a symphony is the chief movement that gives the whole work its character. It often takes sonata form.[1] It may be preceded by a slow introduction. The second movement is usually a slower and expressively lyrical one. The third movement has often a light-hearted scherzo movement.[2] The last movement returns to the faster pace and longer length of the first movement but is lighter in form. It is essentially the first movement with variations. There should be a homogeneity or correspondence between the four movements to maintain a sense of unity and purpose in the symphony as a whole.[3]

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[1] Sonata form is an organisational musical form distinct from the composition that bears the title sonata. For example a sonata generally refers to piece of music composed of two or more movements, or distinct sections, played by one or two instruments and having no more than three independent parts. An example of this would be Ludwig Van Beethoven's "Moonlight Sonata" for piano or "Clair De Lune" by Claude Debussy also written for piano. The sonata form employed in the Symphony on the other hand consists of three elements; exposition, development and recapitulation. The first section (A), which functions as the exposition stating the musical subject or theme, the contrasting section (B) explores or expands on the subject and the recapitulation (A) which restates the subject introduced in the first section. There may also be a slow paced introduction and coda, which are extraneous to the basic structure.

[2] A scherzo is a "quick, light movement or piece, often in triple time" that came to replace the minuet in the late 18th century as the traditional third movement of large-scale forms such as the symphony. It is generally in ternary form, with a contrasting middle section. Wendy Thompson. "scherzo," *The Oxford Companion to Music*, Alison Latham (Ed.), Oxford Music Online. <http://www.oxfordmusiconline.com/subscriber/article/opr/t114/e5951> [Accessed: June 12th 2011].

[3] Percy Scholes, *The Oxford Companion to Music*, 10th Edition, 1970, London: Oxford University Press, p. 999.

The first movement of *Symphonie Diagonale* does function as an exposition, introducing the motifs and figures that we will continue to encounter throughout the film. The second movement, however, does not have any of the usual characteristics of a second symphonic movement. It does expand and develop the themes established in the first movement but does not take the time to lyrically dwell on it, retaining, as it does, the same steady metrical compound 4/4 time signature of the first movement. The lack of a contrast between these movements does not allow for a clear demarcation between movements, nor does it provide us with breathing space to digest the ideas of the first movement and indeed, hardly gives us time to draw breath as it dives straight into extremely complex visual arrangements. The third, scherzo section is not the blithe dance movement that we would traditionally expect to encounter in a symphony. It is too formal and regimented in its rhythm; the transition between the figures often appearing stilted and awkward. The imagery, although related to that which we have thus far encountered in earlier movements, is markedly different. The highly complex figures on the screen are composed of many interconnected abstract figures.

A symphony, indeed any musical work, is an art where the manipulation of time is fundamental. One cannot change the temporal structure of any movement without affecting the proportions of the whole composition. Likewise, changing the structure of a visual music work like *Symphonie Diagonale*, as Hans Richter clearly did in the wake of Viking Eggeling's death, affects the balance of the piece. The ending specifically does not resolve to an adequate resolution. The fourth movement is too fast and incongruous with the exacting nature of previous movements. If we are to take the symphony as an analogy for an argument with the introduction setting it up, the second movement and third movement explaining and exploring it; then the final movement should reiterate the argument and form a synthesised conclusion. Although the final movement of *Symphonie Diagonale* clearly reintroduces themes and figures that we have met before, the manner in which they are presented is incongruous. Their timing does not fit with the rest of the film and does not provide the viewer with a resolved sense of equilibrium.

Due to its loose interpretation of the classic symphonic form and strict formal, organisational system, I would argue that this film has more in common with the serial method of composition, a technique for writing music first developed by Arnold Schoenberg during his later period. Although *Symphony Diagonale* pre-dates Schoenberg's move from atonal music to music composed using the serial system it was composed towards the end of Schoenberg's self-imposed seven year silence during which

he was formulating his theories and I suggest that *Symphonie Diagonale* is constructed in a similar ordered spirit. Schoenberg, like Eggeling, was striving to conceive a new basis capable of integrating the new chordal and melodic structures that had become a feature of early twentieth century music into an ordered, systematic framework. In his 1941 article "Composition with Twelve Tones" Schoenberg writes:

> as in a dream…Strongly convincing as this dream may have been, the conviction that these new sounds obey the laws of nature and of our manner of thinking – the conviction that order, logic, comprehensibility and form cannot be present without obedience to such laws- forces the composer along the road to exploration. He must find, if not laws or rules, at least ways to justify the dissonant character of these harmonies and their succession.[4]

One can see that Schoenberg and Eggeling are striving for similar ideals even if they are in seemingly different artistic forms.

Under Schoenberg's twelve-tone system of composing all twelve notes of the octave are employed in every composition. The notes are all considered equal. No one note is privileged over the other notes. There is no special key; there are no dominant or sub-dominant notes. Every composition is made of one theme or formula and in this theme each of these twelve notes occurs only once. The composer predetermines the order in which each of these notes occurs. As with a traditional tonal composition, the formula is applied both horizontally, with melodies unfolding over time (left to right on the manuscript page) or vertically in chords. Throughout the composition the notes, whether used singly in a melodic line or combined into a chord or accompaniment occur in the same formulaic order. There should be no departure from the order of notes in the theme until the series has been exhausted and can start again. Any chords following one another make up, as a whole, the original set of twelve notes in the original order.

Even though *Symphonie Diagonale* does not use a figurative equivalent of the twelve notes of the chromatic scale, like the twelve-tone system, it is not imposing a key on the work. It is very difficult to pick out a musical key in a visual piece but it is theoretically possible to indicate whether a key is "major" or "minor." One of the first pieces of musical theory that children encounter at piano lessons is whether a musical composition is "happy" or "sad", major or minor. From the tone of a piece of music or film we could hazard a guess as to the mood of the key. As *Symphonie Diagonale* is so metrically and formally structured it is not possible to tell whether it is in a major or minor

[4] Arnold Schoenberg, "Composition with Twelve Tones," *Style and Idea: Selected Writings of Arnold Schoenberg*, Leonard Stein (Ed.), 1975, New York: St. Martin's Press, p. 226.

key as it appears that like in Schoenberg's more formal work the emphasis was on the structure of the piece rather than the content.

Under Schoenberg's compositional system a twelve-tone series may occur in four ways: the first formulation of notes, the first formulation reversed (in retrograde order), the formula inverted or the inverted formula reversed (in retrograde order). Ultimately there are forty-eight forms in the serial composer's arsenal. Rhythm is not subject to these rules and is free, notes can jump octaves and any pitch can be used. In spite of this seeming freedom the principle of equality is still maintained. Contrasts of concord and discord however are practically unobtainable. Although *Symphonie Diagonale* does have many more permutation in its visual arsenal it does maintain a harmonic stability and principle of equality through the reciprocal contrapuntal movement of figures.

One problem that occurs with serial composition is that when even the most recognisable of melodies, for example Beethoven's "Symphony No. 5 in C minor, Op. 67" (1804-08) or even "Twinkle Twinkle Little Star" (n.d) is reversed they become unrecognisable to the ear. A retrograde or reversed theme sounds like a different theme. It sounds as though there is no longer one serial formula being employed but two. Palindromes in music do not for the most part work. The same cannot be said for visuals. Take for example the theme of the harp figure receding as a reflected figure grows in a reciprocal movement. When the action is reversed we can recognise it as a play on the original theme. This of course begs the question is the film actually visual music if the variation on the theme is no longer aurally recognisable. The short answer would be that one could not make literal note for note, or note for figure, analogies between the visual music text and visual music. Rhythm, pitch, volume, tone and even colour can be compared literally but unless the visual is generated from the same mathematical basis as the musical note, they must exist in separate realms and bear no literal translation.

Unfortunately the original full negative of Eggeling's intended film is no longer in existence and we are forced to rely on an archival version reconstituted by Hans Richter. He engaged draughtsman Eiden Bentz to make a copy of Eggeling's original rolls after the death of Eggeling. There does appear to be a fragment of the original film in the possession of the Cinématheque Français, which according to the Fimliga programme of 1928 ran for eighteen minutes and was "visually speaking, much richer and more dynamic."[5] In addition, Erna Niemayer-Soupault, who aided Eggeling in his making of the

[5] Cecile Starr, "Film Notes," *Dada Cinema DVD*, 2005, Paris: Re:Voir Video and Editions du Centre Pompidou, p. 19.

film, asserts that Richter's version is "unrepresentative of the spirit of the original."[6] Eggeling himself was very exacting of his work and remade the film three times until he was satisfied with the result. A.L. Rees writes that there was a clash between Richter and Eggeling after which Richter's style became more hard-edged and geometrical, closer in style to Bauhaus constructivism.[7] The structure of the final movement clearly shows traces of Richter's more basic formal film aesthetic.

It is difficult to know for certain the specificity of some of Eggeling's philosophical ideas or structural intentions in *Symphonie Diagonale* as they appear to have been filtered or interpreted through the writing of Hans Richter in the wake of Eggeling's death. We do know that the original version of the film was eighteen minutes in length, which is still considerably shorter in duration than a typical symphony, but it is possible that the extra time allowed for a greater exploration and development of theme. It is also possible that the original version is truer to the symphonic form. In *Abstract Film and Beyond* Malcolm LeGrice asserts that *Symphonie Diagonale* does not explore kinetic dynamism and is merely an organised "treatise in visual logic."[8] This view serves to ignore the role of the musical in the film. Even in Richter's film *Rhythmus 21*, about which one is often left with the impression that the various thematic sections have been moved around out of Eggeling's intended context there is a definite attempt to organise the elements musically through the use of the symphonic form, counterpoint and recurring motifs. Ultimately we must bear in mind that this is one of the earliest attempts of visually music on film and perhaps if Eggeling had lived long enough to complete another one we would have seen a development in his work towards a greater correspondence between the aural and visual realm.

Although Eggeling clearly had a *plastic* agenda other than the pure visualisation of music it is obviously more than just a structural framework for his ideas on plasticism and Dadaism. This is belied by the delicacy of his figures. Adolf Behne wrote in 1925, "Viking Eggeling was certainly the first to recognise the artistic, non-literary possibilities and consequences of films with full clarity."[9] Laszlo Moholy-Nagy sums up Eggeling's contribution not only to visual music but also to abstract cinema:

> Not only was he first to discover the all-prevailing, revolutionary importance of an esthetic of time in film, he set forth its principles with scientific precision

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[6] *ibid.*
[7] Rees, *op. cit.*, p. 37.
[8] LeGrice, *op. cit*., p.24.
[9] Adolf Behne, "Viking Eggeling," *Experimental Animation: An Illustrated Anthology*, Robert Russett and Cecile Starr (Ed.s.), New York: Van Nostrand Reinhold Company, p. 47.

> and attempted to carry them over into his creative work. His experiments at first leaned upon musical frames of reference, such as the division of time, regulation of tempi, and over-all structure. Slowly, however, his perception of optical timing asserted itself, and so his first work, based upon form-drama, became a veritable ABC of the phenomena of movement, as expressed by light-dark and by variations in direction.[10]

Although Eggeling only lived to complete one visual music film, it is difficult to underestimate the enduring influence of this film on, not only subsequent visual music makers, but structural and structural/materialist filmmakers who were inspired by the rigorousness of his approach to filmmaking and his engagement with the materiality, structure and form of film. In addition to *Symphonie Diagonale's* lasting sphere of influence it is very much a child of its time. It embodies the new philosophies underlying the arts in the wake of the devastation wrecked by the First World War.

As Sitney, Turvey, Le Grice, Van Doesburg et al have identified, the visual aspects of Eggeling's film are clearly derived from cubism and the *neo-plastic* spirit of De Stijl. However, Eggeling takes the *implied* rhythm from the static images of neo-plastic painting and invests them with *literal* rhythm by introducing temporal motion. His motion painting approaches the state of music by using music as a formal structural metaphor around which to build his film. This formal constitution readily lends itself to a formal textual analysis.

Eggeling conceived *Symphonie Diagonale* as a silent composition, intending for the musicality of the visuals to be enough to evoke the sensation of music in the audience. This lack of an audible musical adjunct makes the film problematic to analyse under the terms laid out in this literature review. Although Eggeling uses the musical analogy to lend the film structure, form and, to a certain extent, content, it cannot be considered to be typically synaesthetic in nature nor can it be regarded as multimedia in the audiovisual sense that Eisenstein or Chion propose. It does however possess characteristics of Wagner's *gesamtkunstwerk* through its use of the musical analogy, combining aspects of painting and music into the new hybrid form of the visual music film.

This literature review has laid the groundwork for the investigations of the way that visual music has thus far been read and has marked out a need for a rereading of visual music films that pays attention to their musical characteristics. It has provided an indication of the writing central to the subject of the visual music film and supplied an interdisciplinary framework for examining the aesthetics of visual music from not only an

[10] Russett, *op. cit*., p. 44.

avant-garde film or art perspective but a musical one too. I have shown that the bulk of scholarship considering the visual characteristics of the visual music film is situated within avant-garde and experimental film criticism and is therefore focused principally on these concerns of visual music as derived from visual art. This has been reinforced by authors who refer to it as "motion painting" thereby grounding it as an extension of art. I have also discussed the prevalent debates surrounding the concepts of synaesthesia and audiovisual correspondence in visual music. In addition, I have stressed the need for a comprehensive musical reading of the formal characteristics of the *absolute* visual music films that I consider to be currently lacking but necessary in order to fully appreciate this body of work. Furthermore, in order to establish the visual music film as a discrete form, my analysis of *Symphonie Diagonale* by Viking Eggeling has demonstrated an example of the methodology that my thesis will draw on. Although this analysis has focused on the more formal musical qualities of this particular film, not all of the films in this thesis are conducive to this level of investigation and therefore the analysis of their expressly musical qualities is tailored to the individual films under consideration.

CHAPTER 2:

THE FORMAL ABSOLUTE IN THE VISUAL MUSIC FILM

The universal language of absolute music not only provided the ideal paradigm for the visual music film, but the late nineteenth century formalist debate in music over absolute and program music also established a theoretical precedent for the public discourse on visual music after 1900. The visual music makers were inspired by the rhetoric and metaphor of music. Drawing on the Romantic ideal of absolute music as the supreme universal language, the visual music filmmakers initially looked on the paradigm of absolute music to give a structure to their work and subsequently for spiritual expression. Two distinct categories of the *absolute* emerged, the *formal absolutism* of Hanslick and the *spiritual absolutism* of Romantic author and critic E.T.A. Hoffmann (1776 – 1822). According to William Moritz the term *absolute* was first appropriated from music and applied to the visual music films of Hans Richter (1888-1976), Viking Eggeling and Walter Ruttmann (1887 – 1941) by critics in the 1920s.[1] For the purposes of my thesis I wish to extend this analogy further by incorporating the categories of the *formal absolute* and *spiritual absolute* as developed by musical theorists. Thus, I will drawn on these two categories as a theoretical framework with which to explore the visual music film.

This chapter will examine the evolution of the concept of absolute music as developed in the nineteenth century. It will pay close attention to the legitimisation of music as an art form that could to be considered in both purely musical and transcendent terms at the same time. Following on from this it will then consider how the development of visual music film relates to the concept of formal absolute music from the abstract black and white modernist animations of Hans Richter and Walter Ruttmann in Germany in the 1920s to the minimalist *Line* films of Norman McLaren (1914-87) in Canada in the 1960s. Even though the visual music filmmakers approach film form in conceptually and visually distinct ways, they aspired to achieve the same absolute expression of form as absolute music, however different their individual efforts otherwise may have been.

[1] William Moritz, "Abstract Films of the 1920s" published in program booklet, *International Experimental Film Congress*, May 1989, Toronto, Ontario: The Art Gallery of Ontario, in association with the International Experimental Film Congress.

THE EVOLUTION OF ABSOLUTE MUSIC

Philosophical ideas concerning music underwent a radical re-examination from the eighteenth to the nineteenth century in the wake of Romanticism. Up until this point, theorists attributed particular *extra-musical* meanings to music in order for it to be deemed to make a worthwhile contribution to society. Under these expectations music must have a meaning outside of itself, a *program* or content, that influenced and was influenced by religious and moral beliefs. Some theorists such as Friedrich Nietzsche, Friedrich Schelling and composer Richard Wagner argued that music achieved its external significance when it used words, as they were more intelligible than *pure melodies*. Consequently, instrumental music was almost completely rejected as a worthwhile form of production. Ironically, according to philosopher Lydia Goehr, the abstract characteristics that led to this dismissal were those championed by later music critics and practitioners.[2] This is not to say that this form of instrumental music, also referred to as non-programmatic or *absolute* music, replaced program music entirely. They have both continued to co-exist simultaneously. There was however, a move to legitimise instrumental or *absolute* music as a valid musical form.

In her book, *The Imaginary Museum of Musical Work: an Essay in the Philosophy of Music*, Goehr summarises four factors that marked a transition in the aesthetic and conceptual theory of music:

1. There was a move from music having value and meaning in its service to something else to one where it had value and meaning in itself.
2. There was not only an extra-musical obligation for music to address our spiritual existence but also an obligation for it to embody the moral, the spiritual and the infinite in musical form.
3. Ideas that could be considered extra-musical could be considered purely music in particular circumstances.
4. The distinction between the formal and the spiritual levels of music functioned on a worldly level but not on a spiritual one. If absolute music was allowed to function on both levels, it could be both transcendent and purely musical at the same time.[3]

As these are fundamental points, pertinent to the argument of this chapter, it is worth taking the time to explore each of these individually.

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[2] Goehr, *op. cit.*, p. 148.
[3] *ibid*., p. 156.

1. There was a move from music having value and meaning in its service to something else to one where it had value and meaning in itself.

Music emancipated itself from the need for an extra-musical program in the eighteenth century by allying itself to the traditional plastic arts of painting and sculpture that had themselves found some independence in the same period. Up until this point, music had been considered an art of performance rather than one that produced an actual product. Audiences experienced music rather than possessed it. This was to change as music began to articulate its need for lasting artefacts. This is noticeably demonstrated in the rise in popularity of composition for the pianoforte. People began to seek out scores that they could play at home on their instruments. Composers such as Frédéric Chopin (1810 – 49) began to write études (musical studies) for piano that combined the traditional ambition of the etude, to explore and develop one specific aspect of piano playing technique, generally with a single musical motif, with a highly developed compositional style. Composer, pianist and conductor Franz Liszt (1811 – 66) (who was an avowed proponent of program music) would arrange, transcribe or compose variations on sections of operas by Wagner, symphonies by Beethoven and Hector Berlioz (1803 – 1869) and Johann Sebastian Bach's (1685 – 1750) fugues for organs so that they could be played on piano.[1] Goehr asserts that the composers were trying not only to achieve independence from the extra-musical at this time but were also endeavouring to validate music as an emancipated, autonomous art to be assessed on its own terms rather than those of painting and sculpture. Goehr writes:

> Music as an emancipated fine art was ideally and gradually to become, then, an independent, autonomous practice, depending on nothing ultimately but itself – its own internal ideals and its own medium – for its functioning power, and significance.[2]

As demonstrated in the previous chapter something similar has been occurring with the visual music film. A parallel can be drawn between music's struggle for emancipation as a self-sufficient art form and the visual music film struggle for autonomy. Just as music felt the need to produce artefacts that allowed it to be reproduced, so did the visual music makers. This is arguably one of the reasons why the colour organ or light show gave way to film as the medium of choice for visual music filmmakers when the technology became available.

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[1] Donald Jay Grout and Claude V. Palisca, *A History of Western Music*, 4th Edition, 1988, N.Y.: W.W. Norton and Company, p. 692.

[2] Goehr, *op. cit.*, p. 148.

Eventually under the influence of the Romantic theorists, music came to be discussed in terms of unique forms such as the sonata and symphony that are peculiar to music itself. Musical form was now considered an independent cogent form and in time, these forms came to be appropriated by other art forms in their formal structures; the most literal case being the visual music film.

Although it was Richard Wagner[3] who first coined the term *absolute music* in his introduction to a program for "Beethoven's Ninth Symphony" in 1846, Eduard Hanslick was the first theorist to discuss it as a formal concept in 1891 in his book *On the Musically Beautiful: a Contribution towards the Revision of the Aesthetics of Music.* Hanslick advocates a formal approach to music. He considers that it is the tone material, the basic notes and rests, of music that expresses the musical idea. Musical compositions were, to him, complete and self-subsistent in and of themselves. They were not a medium for the projection of the ideas and feelings of the composer. He encapsulates these ideas in the following statement: "Music demands once and for all to be grasped as music and can be only from itself understood and in itself enjoyed."[4]

Hanslick theorised that musical elements in a composition are mysteriously bonded together through natural laws that regulate rhythm, melody and harmony. These are not bonds that can be examined scientifically but are known instinctively by the listener. Music has its own musical sense and logic and Hanslick labels it a language that we speak and understand and yet cannot translate. Each individual element in a musical piece contributes to its unique expression and affect on the listener. Peter Kivy asserts that once the notes or chords of music have become music to the listener, they "have become objects of perceptual cognition."[5] He also points out that music possesses emotion as a perceptual quality even though musicologists do not agree how it does, merely that it does.[6] It can however only possess general emotions such as happiness, sadness, fear and so forth. It cannot embody specific emotions. Hanslick suggests, therefore, that the effect of music on the listener is not coming from the will or influence of the composer but from the musical features constituting the chromaticism of the melody, much like the analogous features in the visual music film.

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[3] See Dahlhaus, *op. cit*., p. 18.
[4] Hanslick, *op. cit*., p. 32.
[5] Kivy, *op. cit*., p. 174.
[6] *ibid.*

2. There was not only an extra-musical obligation for music to address our spiritual existence but also an obligation for it to embody the moral, the spiritual and the infinite in musical form.

Hanslick is considered to be the ideologue of the musical formalists and demonstrates an ahistorical approach to absolute music that focuses on questions of form rather than the spiritual but Dahlhaus suggests that this is at least partially deceptive.[1] This idea is corroborated by Nicholas Cook in his essay "Theorising Musical Meaning." Cook writes that it was only at the end of the nineteenth century that Hanslick's book "came to be read as a denial of music's capacity to support expressive meaning."[2] In fact, under closer scrutiny Hanslick's concept of absolute music does in fact veil more metaphysical considerations; by disassociating itself from text, plot, function - anything that has a program or agenda - and positioning itself as a pure form of instrumental music the music is made available to be appreciated in more spiritual terms.

As stated by Goehr, music developed an obligation to "embody the moral, the spiritual and the infinite in musical form."[3] According to Goehr, theorists at the time such as Gustav Schilling, claimed that the importance of art lay in its ability "to probe and reveal the higher world of universal, eternal truth."[4] She also indicates that this ability has foundations in man's attempt to transcend normal human cognition and enter a more spiritual realm. This is supported by Schilling's statement, "No aesthetic material is better suited to the expression of the ineffable than is sound."[5] Instrumental music, without "particularised content"[6] was therefore the art form most suited to being a *universal language* of art.

Goehr states that the suggestion that music expressed transcendent meaning soon developed into ideas that it embodied the transcendent:

> It was the shift from imitation of particulars to immediate expression and embodiment of the transcendent that ultimately gave to instrumental music its new meaning. Indeterminate on a concrete level, it was deemed utterly meaningful on a transcendent one. Precisely in its indeterminacy was it able to capture the very essence of emotion, soul, humanity, and nature in their most general forms.[7]

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[1] Dahlhaus, *op. cit*., p. 28-29.
[2] Nicholas Cook, "Theorising Musical Meaning," *Music Theory Spectrum,* Vol. 23, No. 2, Autumn, 2001, p. 174.
[3] Goehr, *op. cit*.
[4] *ibid.*, p. 153.
[5] Gustav Schilling cited in Goehr, *op. cit*., p. 153-154.
[6] Goehr, *op. cit*., p. 153.
[7] *ibid.*, p. 155.

Karl Philipp Moritz (1757 – 93) develops this idea in his 1788 treatise *On the Visual Imitation of the Beautiful*. Moritz posited, "[A] work of art, insofar as it fulfils no external purpose and exists instead for its own sake, is a whole perfected in itself."[8] He goes further than Hanslick by claiming that the only whole that is perfected in itself is nature and the universe and music, indeed all art, must both reflect and embody nature. In other words, Moritz, like the ancient Pythagoreans, interprets the autonomous work of music or art as a metaphor for the universe. This idea is found at the heart of Piet Mondrian's paintings, in addition to the visual music films of Eggeling and Richter. It is also central to Norman McLaren's trilogy of *Line* films and John Whitney's computer films that are subject to closer scrutiny later in this chapter.

3. Ideas that could be considered extra-musical could be considered purely music in particular circumstances.

In the late nineteenth and early twentieth century, the majority of proponents of program music were followers of Wagner. As indicated by Goehr they contended that music achieved its "external significance" when it used words, as they were more intelligible than "pure melodies."[9] Consequently, they almost completely rejected instrumental music as a meaningful form of musical production.

In spite of Wagner's position as chief advocate of program music, he proves a controversial figure. Although, as mentioned, he conceived the term absolute music in relation to instrumental music without external reference, he disdained it as a *partial artwork*. It was only the *total* artwork of opera that Wagner deemed to be true music. Carl Dahlhaus writes that he did not entirely deny the romantic metaphysic of the symphony. Instead he reinterpreted it as an intermediate step in the dialectic process of musical re-examination at the time.[10] He also argues that Wagner had appropriated philosopher Arthur Schopenhauer's (1788 – 1860) aesthetics in 1854, which he asserts was in effect an aesthetic of absolute music.[11] Schopenhauer believed the true essence of "emotional stirrings" is articulated in music according to its form without resort to motivation or specific object. Up until Schopenhauer the accepted idea was that the text in vocal music expresses a sense of the *whole* or *total* artwork. Schopenhauer turned this idea on its head and claimed that the emotion portrayed by music was representing the logic of the work.

[8] Karl Philipp Moritz cited in Dahlhaus, *op. cit*., p. 28.
[9] Goehr, *op. cit*., p. 153.
[10] Dahlhaus, *op. cit*., p. 22.
[11] *ibid.*, p. 130.

The conceptual part appears as the exterior of the music and the emotion as the interior. Both of the aesthetics of absolute music, Hanslick's formal absolutism and Schopenhauer's spiritual absolutism, treat the texts of vocal music and the models of program music as extra-musical subsidiaries. Unlike Hanslick, however, Schopenhauer distinguishes in degree and not in principle between the process of painting music by way of a text or something extra musical and the way in which the imagination can be stimulated to form visual images by the action of listening to music.[12]

Wagner's acceptance of Schopenhauer's aesthetics complicates the theory of program music. Wagner had always advocated that music needs a motive for its form, but according to Schopenhauer this motive can be a condition for the creation of music but is not essential to its being. Moreover, under Schopenhauerian aesthetics programs or texts are considered too weak to affect the absolute essence of music.[13] Therefore, these extra-musical attributes could be considered "purely musical" in certain situations.[14]

4. The distinction between the formal and the spiritual levels of music functioned on a worldly level but not on a spiritual one. If absolute music was allowed to function on both levels, it could be both transcendent and purely musical at the same time.

Thus far, it has been established that there were two main claims for music under the new romantic ideals of the eighteenth and nineteenth century. The first was a formalist claim, which saw meaning in musical form rather than extra-musical elements. The second was a claim of transcendence from the world of the concrete and particular to the spiritual and universal. German idealist philosopher Friedrich Wilhelm Joseph von Schelling (1775 – 1854) reconciled these claims by contending that pure form in music could elevate it to a spiritual language and still contain purely musical meaning.[15] Schelling believed that truth and beauty "are merely two different ways of viewing the Absolute, and philosophy, art, and the cosmos are one."[16] He viewed music and its associated forms as:

> ... the forms of eternal things insofar as they can be contemplated from the perspective of the real... Thus music manifests, in rhythm and harmony, the pure form of the movements of the heavenly bodies, freed from any object or

[12] Dahlhaus, *op. cit*., p. 131.
[13] *ibid.,* p. 135.
[14] Goehr, *op. cit.,* p. 153.
[15] *ibid.*
[16] Herbert M. Schueller, "Schelling's Theory of the Metaphysics of Music," *The Journal of Aesthetics and Art Criticism*, Vol. 15, No. 4 (June 1957), Blackwell Publishing.

> material. In this respect, music is that art which casts off the corporeal, in that it presents movement in itself, divorced from any object, borne on invisible, almost spiritual wings.[17]

Schelling's philosophy of music influenced both Schopenhauer and E.T.A. Hoffmann. According to Mark Evan Bond Hoffmann "perceived music as occupying an altogether separate sphere beyond the phenomenal, thereby endowing musical works with the power to provide a glimpse of the infinite."[18] He viewed musical harmony as "the image and expression of the communion of souls, of union with the eternal, with the ideal that rules over us and yet includes us."[19]

In conclusion, we can see that attempts to legitimise absolute music during the romantic period left it in an ambiguous position. As well as embodying itself as a formal musical structure, devoid of specific content, it could now embody *everything*. Ultimately, however, music's emancipation from the extra-musical, its freeing from an obligation to provide a meaningful contribution to society and its subsequent autonomy in the Romantic period led to it becoming an ideal model for the other arts. It became specifically pertinent as a model for the absolute visual music film, which had been striving to find legitimacy as a distinct entity, from the twentieth century onwards.

THE FORMAL ABSOLUTE POST WORLD WAR ONE

The formalist debate in music over programmatic and non-programmatic (absolute) music may have created a theoretical framework for visual music but it was to be the disillusionment with existing artistic structures in the wake of the First World War that was to make the model of absolute music the ideal structure to underpin a new regime in art, music and film. In his essay "Towards a Newer Laocoon," American art critic and champion of modernism, Clement Greenberg identifies this shift from ideas that were bound up in nationalism and ideology after the Great War to one where there was an emphasis of form.[20] There was a sense that artists were searching for a new way forward, free from the weight of history and what had come before and what better model than that of absolute music, which in the words of music theorist Daniel K.L. Chua has "no history"

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[17] Schelling cited in "Idealism and the Aesthetics of Instrumental Music at the Turn of the Nineteenth Century," Journal of the American Musicological Society, Vol. 50, No. 2/3, Summer - Autumn, 1997, Mark Evan Bonds, University of California Press, pp. 403 – 404.

[18] *ibid.,* p. 412.

[19] *ibid.,* p. 413.

[20] Clement Greenberg, "Towards a Newer Laocoon," *Art in Theory 1900-2000: An Anthology of Changing Ideas*, Charles Harrison and Paul Wood (Eds.), 2003, Oxford: Blackwell Publishing, p. 565.

and "denies that it was ever born."[21] Neo-Plastic artists from the Dutch group De Stijl such as Mondrian encapsulated the prevailing mood in the following statement: "For let us not forget that we are at a turning point of culture, at the end of everything ancient: the separation between the two is absolute and definite."[22] The first point in the De Stijl[23] Manifesto written in 1918 states:

> There is an old and a new consciousness of time.
> The old is connected with the individual.
> The new is connected with the universal.
> The struggle of the individual against the universal is revealing itself in the world war as well as in the art of the present day.[24]

There was a rejection of traditional concepts of beauty and a search for a new paradigm that would better serve the spirit of the age. The avant-garde search for a universal language that could provide a framework for the articulation of this spirit inevitably led avant-garde artists such as Paul Klee and Kandinsky to turn towards the 'pure form'[25] of absolute music. Greenberg writes:

> The effects of music are the effects, essentially, of pure form; those of painting and poetry are too often incidental to the formal nature of these. Only by accepting the example of music and defining each of the other arts solely in the terms of the sense or faculty which perceived its effect and by excluding from each art whatever is intelligible in the terms of any other sense or faculty would the non-musical arts attain the 'purity' and self-sufficiency which they desire, that is, in so far as they were avant-garde arts.[26]

In other words there was an emphasis on the senses and an idea of *art pour l'art.* Just as the Romantics rejected external representations in music so did the modern painters. Poet Guillaume Apollinaire (1880 – 1918) emphasised the importance of form over content in his statement: "The subject no longer counts, or if it counts, it counts for very little."[27] Mondrian also expressed this idea of eschewing descriptive content:

> ... [T]he new spirit suppresses *description* in art. Because the obstacle of form has been destroyed, the new art affirms itself as *pure plastic.* The newest spirit has found its *plastic expression*. In its maturity, the one and the other are neutralised, and they are coupled into unity. Confusion in the apparent unity of

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[21] Daniel K.L. Chua, *Absolute Music and the Construction of Meaning*, 1999, Cambridge: Cambridge University Press, p. 3.

[22] Piet Mondrian, "Neo-Plasticism," *op. cit.*, p. 290.

[23] De Stijl refers to the group of Dutch Neo-Plastic abstract artists such as Theo Van Doesburg, Piet Mondrian and Bart van der Leck, gathered around the art journal *De Stijl*, which was first published in 1917)

[24] De Stijl, "De Stijl: Manifesto 1," *Art in Theory 1900-2000: An Anthology of Changing Ideas*, Charles Harrison and Paul Wood (Eds.), 2003, Oxford: Blackwell Publishing, p. 281.

[25] Greenberg, *op. cit*., p. 565.

[26] *ibid.*

[27] Guillaume Apoillinaire, "On the Subject in Modern Painting," *Art in Theory 1900-2000: An Anthology of Changing Ideas*, Charles Harrison and Paul Wood (Eds.), 2003, Oxford, Blackwell Publishing, p. 187.

> interior and exterior has been resolved into an *equivalent duality forming absolute unity*. The individual and the universal are *in more equilibrated opposition.* Because they are merged in unity, description becomes superfluous: *the one is known through the other.* They are plastically expressed without the use of form: *their relationship (through plastic means) creates the plastic.*[28]

Greenberg proposes in his essay "Avant-Garde and Kitsch" that the avant-garde arrived at this *abstract* or *non-objective* (non-representational) art in their search for the avant-garde.[29] He writes:

> The avant-garde poet or artist tries in effect to imitate God by creating something valid solely on its own terms, in the way nature itself is valid, in the way a landscape – not its picture – is aesthetically valid; something given, increate, independent of meanings, similar or originals. Content is to be dissolved so completely into form that the work of art or literature cannot be reduced in whole or in part to anything not itself.[30]

This dissolution of form would lead to a flat two-dimensional image. Greenberg asserts that this was due to painting striving for autonomy as an art form.[31] This two-dimensionality was the only characteristic that painting could possess that was not shared with other plastic arts. Sculpture and even painting up until this point had existed in three dimensions, through use of perspective and reference to external objects. Artist Hans Hofmann (1880 – 1966) echoes this assertion in his 1931 article "On the Aims of Art." He claims that the "essence of the picture is its two-dimensionality."[32] Hoffmann as Maya Deren would later do in relation to film, is making a claim to each art having a defining and unique feature. For Deren, and indeed Eisenstein, the element of time was film's distinctive feature. This desire for autonomy in modernist art and film by virtue of their emphasis on medium specificity could be considered to parallel the attempt by instrumental music to claim legitimacy in the eighteenth and nineteenth century by claiming that music as an art form had distinct qualities. Furthermore it would *seem* to plough the same formalist furrow that Hanslick had already advocated in relation to music in the nineteenth centuries. I use the word *seem* as I pointed out earlier in the chapter that authors such as Cook indicate that Hanslick's book *On the Musically Beautiful: A Contribution towards the Revision of the Aesthetics of Music* was misread as a repudiation of music's ability to carry a transcendent meaning. Cook indicates that what matters in

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[28] Mondrian, *op. cit*., p. 290.

[29] Clement Greenberg. "Avant-Garde and Kitsch," *Art in Theory 1900-2000: An Anthology of Changing Ideas*, Charles Harrison and Paul Wood (Eds.), 2003, Oxford: Blackwell Publishing, p. 541.

[30] *ibid.*, p. 541.

[31] *ibid.*, p. 565.

[32] Hans Hofmann, "On the Aims of Art," in *Art in Theory 1900-2000: An Anthology of Changing Ideas*, Charles Harrison and Paul Wood (Eds.), 2003, Oxford: Blackwell Publishing, p. 373.

this circumstance is not what Hanslick meant but what he was understood to mean. By the early twentieth century the accepted reading of Hanslick was that music "was to be understood in exclusively structural terms while issues of meaning were ruled out of court."[33] Under these terms it is the tone material, the basic notes and rests, of music that expresses the musical idea. Musical compositions were considered complete and self-subsistent in and of themselves. They were not a medium for the projection of the ideas and feelings of the composer. It is no surprise therefore that formal absolute music became the perfect model for art at the beginning of the twentieth century. Chua identifies that the "elevation of "Art" as some kind of divine utterance, purged of all function and fashion" appeared to endow modernity with the meaning and legitimisation it needed. He writes, "Art" became a religion of modernity, and absolute music, as the condition to which all art should aspire, was its God."[34]

THE SEARCH FOR THE UNIVERSAL IN THE VISUAL MUSIC FILMS OF HANS RICHTER AND VIKING EGGELING

Visual music pioneers Hans Richter and Viking Eggeling were clearly influenced not only by ideas of absolute music but also by Kandinsky's ideas on the spiritual in art. Kandinsky considered music to have a direct access to man's soul due to the capacity of the abstract form to express inner longing.[35] By the time Richter and Eggeling were introduced to each other by Dadaist Tristan Tzara (1896 – 1963) in 1918 they were already separately pursuing the analogy between music and painting. Although Richter specifically wished to paint completely objectively, incorporating the principle of music in this work did not mean that he wished to create forms that imitated specific musical compositions or that either he or Eggeling were attempting to exactly visualise music. They were instead seeking a system or theory that would embody their philosophy. Richter explains that such a system was to be found in the musical notion of counterpoint, which means "point against point" or, more generally, "melody against melody."[36]

> In musical counterpoint, we found a principle, which fitted our philosophy: every action produces a corresponding reaction. Thus, in the contrapuntal fugue, we found the appropriate system, a dynamic and polar arrangement of

[33] Cook, "Theorising Musical Meaning," *op. cit.*, p. 174.
[34] Chua, *op. cit*., p. 9.
[35] Kandinsky, *op. cit*., p. 161.
[36] Taylor, *op. cit.*, p. 126.

> opposing energies, and in this model we saw an image of life itself: one growing, another declining, in a creative marriage of contrast and analogy.[37]

Richter and Eggeling, like the Neo-plastic painters, were not merely trying to explore formal relationships but were attempting to create a new universal language of visual art. They produced a, now lost, pamphlet entitled *Universelle Sprache*, which outlined the grammar for their new universal language of art. Goehr writes that Romantic theorists argued that instrumental music, free of particularised content is the most conceivable aspirant for being the "universal language of art."[38] Music was a direct route to a truth that transcended time and transitory human feelings to become something more than the product of the time in which it is produced. Musical form was therefore the obvious syntax for Richter and Eggeling to pursue.

In their search for this new universal language Richter and Eggeling were striving for an art form analogous to formal absolute music, in which it is not the individual forms (the content) that are important (hence the dissolution of representation) but the relationship that these elements have to each other in the wider construction of the film form. At times, however, it would appear that, unlike in a formal absolute music sonata or symphony, it is the primacy of the relationship between the formal elements that takes precedence over the overarching structure. As noted in the previous chapter Eggeling's *Symphonie Diagonale*, in spite of its aspirations, does not exemplify the symphonic form, uniting the formal elements through the standard of counterpoint and internal rhythm. This idea tallies with Hanslick's ideas about cogency in musical form. Under Hanslick's ideas the four musical movements that underpin musical form such as the sonata or symphony coalesce according to laws of musical aesthetics. This is distinct from ideas on programmatic "feeling" theories, which purported that the movements represented four separate states of mind of the composer that must be gathered into a coherent whole.[39] Hanslick thought that if the movements of a composition appear unified then their unity has its basis in the musical determinants such as rhythm, harmony and melody. This is especially apparent in Richter's film *Rhythmus 21*. The form of the film is held together by the dynamism of the rhythm rather than a structured musical framework.

The first half of the twentieth century saw a progressive breaking down of musical structures that had prevailed in Western musical culture for over two hundred years.

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[37] Hans Richter, "Easel-Scroll-Film," *Experimental Animation: An Illustrated Anthology*, Robert Russett and Cecile Starr (Ed.s), 1976. N.Y.: Van Nostrand Reinhold Co., p. 50.

[38] Goehr, *op. cit.*, p. 155.

[39] See Chapter Three: The Musically Beautiful in Eduard Hanslick *op. cit.* for a further explanation of theories of "feeling."

Traditional sonata and symphonic structure began to be abandoned in favour of new organisational forms such as Greek composer and mathematician Iannis Xenakis' introduction of mathematical processes based on probability theory and chance operations. *Rhythmus 21* does not appear to follow a specific form. It is instead spread into a series of segments consisting of musical "phrases" that explore variations on the motif of the four-sided rectangle. Although the phrases within each segment inter-relate they could for all intents and purposes have been moved around and reordered or deleted as Richter saw fit. In some ways the piece shares common ground with "Klavierstück XI" (1956) by German composer Karl Heinz Stockhausen (1928 – 2007). The score of "Klavierstück XI" consists of nineteen short segments of notation that can be put together in any order desired by the pianist. Stockhausen's intention was that the piece would end when any one of the segments was repeated. Unlike Stockhausen however, Richter was not concerned with ideas of indeterminacy and repeats segments to reinforce the unity between the discrete elements.[40]

Although Richter was making *Rhythmus 21* concurrent with Viking Eggeling's *Symphonie Diagonale* they are structurally very different films. *Symphonie Diagonale* is a nuanced and complex arrangement of curvilinear forms that attempts to explore the symphonic form in the visual domain. Richter's film, however, is a superficially simpler work, but this apparent simplicity is misleading. *Rhythmus 21* has a different agenda to *Symphonie Diagonale*. Richter's first visual music film *Rhythmus 21* epitomises not just the spirit of the formal absolute music advocated by Hanslick but also a plastic spirit. Richter writes that although influenced by Cubism and its search for structure he was not satisfied with what it offered. This led him to believe that the suppression of "spontaneous expression" was the best way for him to create an objective principle that could control the "heap of fragments" inherited from the Cubists.[41] Free improvisations such as those of Kandinsky in his paintings would have to come after the establishment of a general organisational principle.[42]

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[40] Indeterminacy is the idea that a performer has the freedom to interpret a composer's work during a performance.

[41] Richter, "Easel-Scroll-Film," *op. cit*., p. 50.

[42] *ibid.*

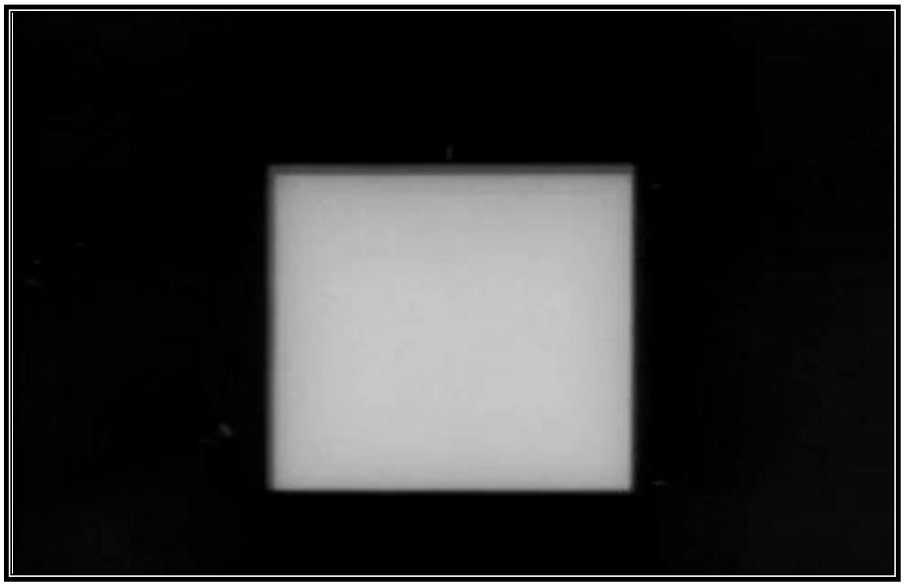

FIGURE 2.1: STILL IMAGE FROM HANS RICHTER. *RHYTHMUS 21* (1921-24). CINEMA DADA [DVD]. 2005. RE:VOIR SHOWING THE FOUR SIDED FIGURE THAT FORMS THE BASIS OF THE FILM

Existing purely on a flat plane the film is a literal translation of Richter's artwork. *Rhythmus 21* has one recurring motif of the interplay of four-sided figures (see figure 2.1). Richter specifically chose this basic form as the "simple square" would allow him to focus

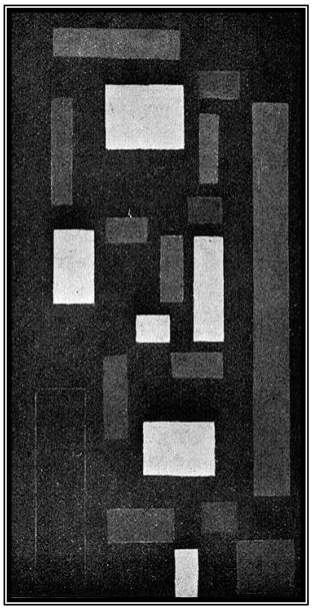

FIGURE 2.2: THEO VAN DOESBURG. *COMPOSITION VI* (ON BLACK FOND (1917?) AD PETERSEN (ED.; 1968) DE STIJL [VOL] 2. 1921_1932. COMPLETE REPRINT 1968, AMSTERDAM: ATHENAEUM, DEN HAAG: BERT BAKKER, AMSTERDAM: POLAK & VAN GENNEP, P. 474. HTTP://COMMONS.WIKIMEDIA.

FIGURE 2.3: THEO VAN DOESBURG. *COMPOSITION VII* (THE THREE GRACES), (1917), HTTP://COMMONS.WIKIMEDIA.ORG/WIKI/FILE:THEO_VAN_DOESBURG_COMPOSITION_VII_(THE_THREE_GRACES).JPG

on orchestrating time and movement.[43] This adoption of the four-sided plane owes a debt to the principles of neo-plasticism as laid out by Mondrian in "Neo-Plasticism: The General Principle of Plastic Equivalence." Mondrian asserts "painting is expressed plastically by *plane within plane*. By reducing three-dimensional corporeality to a single plane, *it expresses* a *pure relationship*.[44] Richter uses this idea of the plane within a plane in *Rhythmus 21*. The screen whether black or white functions as the plane on which other planes move and transform. However, although *Rhythmus 21* contains images that include direct visual references to Mondrian's paintings, in many ways it bears a greater relation to the paintings of Mondrian's De Stijl contemporary Theo Van Doesburg (1883 – 1931), specifically in his use of diagonal lines in certain sections. Mondrian maintained the use of horizontal lines throughout his career even on the occasions that he rotated the canvas so that it was at a 45-degree angle (see figure 2.2, figure 2.3, figure 2.4 and figure 2.5).

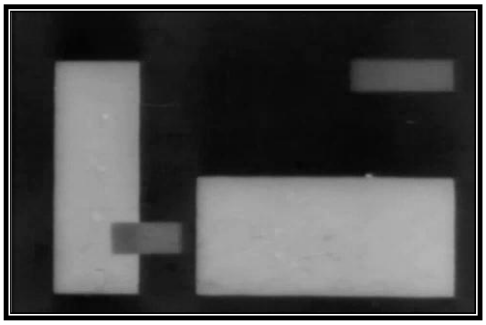

FIGURE 2.4: RICHTER, *RHYTHMUS 21* (1921-24), *OP. CIT.* DEMONSTRATING THE RESEMBLANCE OF THE IMAGERY TO THE NEO-PLASTIC PAINTINGS OF THEO VAN DOESBURG AND PIET MONDRIAN.

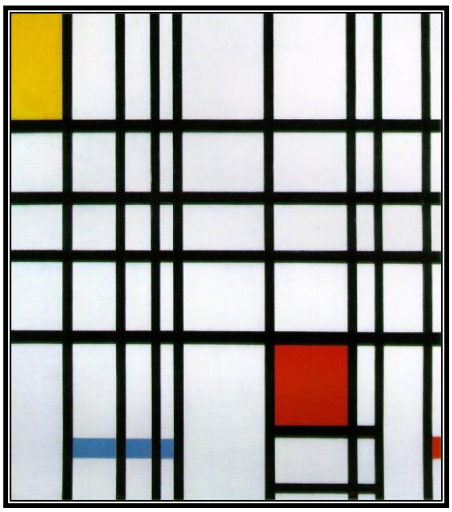

FIGURE 2.5: PIET MONDRIAN. *COMPOSITION IN RED, YELLOW AND BLUE* (1921), HTTP://EN.WIKIPEDIA.ORG/WIKI/FILE: MONDRIAN_COMPRYB.JPG

Van Doesburg visited Richter and Eggeling at Richter's family home in Klein-Koelzig after hearing about their work because he "felt an artistic kinship"[45] with them. In a report published in the *De Stijl* journal in 1921 Van Doesburg wrote

> It is helpful to compare abstract filmmaking with visual music, because the whole composition develops visually, in its open field of light, in a manner more or less analogous to music. The spectator sees the composition already worked out by the artist in a "score" come into being, attain a clearly defined

[43] Hans Richter, "Letter to Alfred Barr November 16th 1942," *Experimental Animation: An Illustrated Anthology*, Robert Russett and Cecile Starr (Ed.s), 1976. N.Y., Van Nostrand Reinhold Co., p. 52.
[44] Mondrian, *op. cit.*, p. 290.
[45] Theo Van Doesburg cited in Lawder, *op. cit.*, p. 49.

> form, and then disappear into the field of light, from which a new composition of totally different structure is built up again.[46]

His assertion however that Richter and Eggeling had "turned to De Stijl"[47] to realise their films is not entirely accurate. Richter and Eggeling were only vaguely aware of the formal experiments of De Stijl when they began to work on the scrolls that would become the basis of their film work. However, Van Doesburg's acknowledgement of an "artistic kinship" between De Stijl and Richter and Eggeling combined with his assumption that their use of music as a method for *scoring* visual compositions was inspired by De Stijl demonstrates both the universality of music as a language and also that music as an organisational principle had entered the collective consciousness of the European art intelligentsia post-World War One.

EVOKING FEELING THROUGH FORM

The most obvious visual influence on the composition of *Rhythmus 21* is the work of Russian Suprematist painter Kazimir Malevich (1879 – 1935). Malevich painted *Black Square* in 1915 (see figure 2.6). Presenting this painting, in which a single black square rests on a white background, was a breakthrough not only in his artistic career but also a milestone in the history of art. The image of the black square on a white background is literally the "figurative minimum" that can occur in order to provide a partition between a background and foreground in a painting. If, as Branislav Jakovljevic suggests, there is a

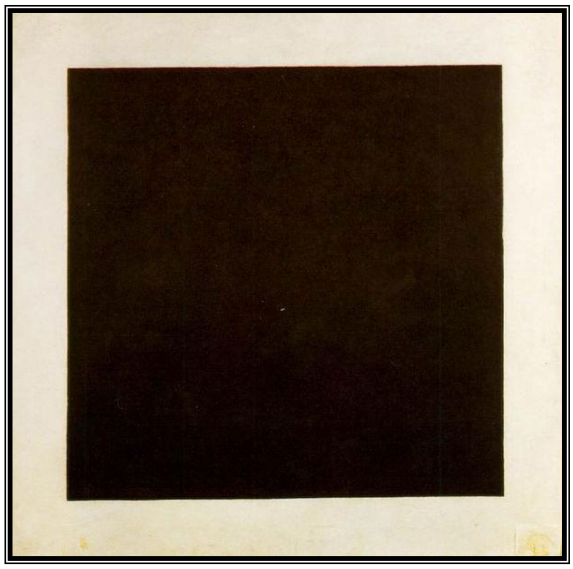

FIGURE 2.6: KAZIMIR MALEVICH, *BLACK SQUARE* (1913), HTTP://EN.WIKIPEDIA.ORG/WIKI/FILE:MALEVICH.

[46] *ibid.*, p. 49.
[47] *ibid.*

"hierarchical ordering of foreground and background"[48] in *Black Square*, it is revealing that there cannot be a "ground without figure and signification."[49] Even in a painting as unquestionably non-figurative as *Black Square*, the colour white signifies a neutral background, in which the black figures are suspended. Abolishing the figure in a painting does not automatically eliminate the object. Malevich abhorred mimesis and strove to achieve absolute non-objectivity by restructuring the contents of paintings. His ambition with his paintings was that "forms must be given life and the right to individual existence."[50] Malevich achieved this emancipation of forms in his later work *Four Squares* (1915). In this painting the square-shaped canvas is organised into a four-squared checkerboard with the black and white squares having equal importance, free of a background or foreground. White emerges from a supporting background role to occupy the same station as black.

Richter was resolute that art should "evoke feeling through form."[51] This idea mirrors Hanslick's theory of the formal absolute as outlined earlier in the chapter. Although Malevich had found a way of giving equivalence to forms, Richter still required a tension between forms in order to orchestrate his film so he adopted Malevich's *Black Square* as a building block for *Rhythmus 21*. Richter achieves his dissolution of ground in *Rhythmus 21* through his use of motion and counterpoint. The black squares on white backgrounds expand on a white background to fill the screen and vice versa, eventually erasing the partition between black and white to give the figure complete equivalency.

Richter was using the idea of counterpoint to create the form of his composition. This use of counterpoint creates a tension in his artwork that is later resolved. This principle of creating tension and subsequently resolving it can be easily demonstrated in music. There is always a sense of resolution in Richter's visual music film. In *Rhythmus 21* this occurs from action-reaction movements of elements according to counterpoint but it additionally occurs from the ordering of the elements and Richter's employment of cadences.

Richter employs definite phrases in *Rhythmus 21* that are marked by cadences or rest at the end of the phrase. These cadences are often marked by visual rests or silences

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[48] Branislav Jakovljevic, "Unframe Malevich!: Ineffability and Sublimity in Suprematism," *Art Journal*, Vol. 63, No., Autumn, 2004, p. 20.

[49] *ibid*., p. 20.

[50] Kazimir Malevich, *Essays on Art 1 9/5-1 928, Vol. I*, Xenia Glowacki-Prus and Arnold McMillin (Trans.), 1968, Copenhagen: Borgen, p. 24.

[51] R. Bruce Elder, "Hans Richter and Viking Eggeling: The Dream of Universal Language and the Birth of the Absolute Film," *Avant-Garde Film, Alexander Graf and Dietrich Scheunemann* (Ed.s), 2007, Rodopi, p. 26.

consisting of black or white frames that remain static until the action is ready to proceed. Richter forms the musical phrases into musical sentences or segments. Within each phrase and sentence there is a unity. In many ways the static four-sided figure functions like a tonic chord restoring stability and unity to the image that movement has disrupted. Richter himself asserted that his aesthetic thesis was the "relationship between every part and the whole."[53]

ASPECTS OF SERIAL COMPOSITION IN RHYTHMUS 21

Richter's film, like Eggeling's, has aspects in common with serial composition, particularly as the form is almost more important than the actual content. Even within the rigorousness of serial composition there is still room for personal expression and unlike Eggeling, I would argue that Richter is more akin to Schoenberg's pupil Anton Webern (1883 – 1945) than Schoenberg himself. Webern's work is more economical and concentrated in style than either Schoenberg or his other famous pupil Alban Berg (1885 – 1935). Unlike Schoenberg and Berg he wrote no opera and concentrated on pure absolute musical composition. Donald Jay Grout and Claude V. Palisca write that each of Webern's compositions in his *mature* period unfolds by imitative counterpoint, often using inversion.[54] This, in addition to an economy of style, is clearly evident in *Rhythmus 21*. Webern, however, avoided the use of sequences and repetition whereas they are much in evidence in *Rhythmus 21*.

Under the influence of Webern a principle of "total serialism" emerged. This total serialism saw the extension of Schoenberg's twelve tone rows to parameters other than pitch. Rather than merely serialising the twelve notes of the chromatic scale composers began to serialise duration, intensity, timbre, texture, silences and so forth.[55] Prior to this these elements had been conceived as being interdependent but were now considered to be interchangeable, just like image sequences in *Rhythmus 21*. Grout and Palisca indicate that music derived from "total serialism" seems devoid of a theme in the classic sense. They also point towards the absence of a distinct rhythmic pulse as well as a lack of sense of progression toward a climax as is typical in a form such as the symphony. In addition, they write that the events form a logical pattern if the work is well constructed. This often

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[53] Richter, *op. cit*., p. 52.
[54] Grout and Palisca, *op. cit*., p. 861.
[55] The chromatic scale consists of the eight white notes of the piano keyboard combined with the four black notes (C, C#, D, D#, E, F, F#, G, G#, A, A#, B).

becomes perceptible only after repeated listening and study.[56] Many of these characteristics are found in the work of Richter. Foreshadowing the move towards minimalism that developed in art, music and the visual music film in the post-World War Two period, there is no development toward a climax. I have already pointed out that the segments could very easily be moved around without the overall unity of the composition being affected.

As for the issue of rhythm, the pace is constant but it is difficult to discern whether or not there is a distinct rhythmic pulse. There is certainly a consistent duration for the disruption, transformation and subsequent resolution of each phrase but there is no real time signature in the traditional sense. Richter has put forward the argument that rhythm would unite the elements and that "the emotional power of form leads to rhythm as the essence of emotional expression."[57] He writes:

> The rhythm of a work is identical with the idea of the whole. Rhythm is that which conveys ideas, that which runs through the whole: its meaning = principle, from which each individual work derives its significance. Rhythm is not a definitive, regular sequence of time and space; it is the unity which ties all the parts into a whole.[58]

There is definitely a logical and systematic pattern in the exploration of the four-sided figure. Richter exhaustively explores all serial permutations of each phrase with inversions of movement and colour-contrast just as Barnett Newman explores a different "form, mood, colour, beat, scale, and key"[59] in his series of paintings, "18 Cantos."

As Cook and Dahlhaus point out, the concept of absolute music does in fact veil more metaphysical considerations; by disassociating itself from text, plot, function; anything that has a program, and situating itself as instrumental music in its most unadulterated form, the music can be understood in more spiritual terms. This is something that is corroborated by Karl Philipp Moritz who states "a work of art, insofar as it fulfils no external purpose and exists instead for its own sake, is a "whole perfected in itself."[60] He goes further than Hanslick by claiming that the only whole that is perfected in itself is nature and the universe, and music, indeed all art, must both reflect and embody nature. In other words Moritz interprets the autonomous work of music or art as a metaphor for the universe. These ideas are inherent in *Rhythmus 21*. Richter and

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[56] Grout and Palisca, *op. cit*., p. 866.
[57] Hans Richter as cited in Elder, *op. cit.*, p. 38.
[58] *ibid.*, p. 38.
[59] Barnett Newman, "Preface for 18 Cantos," 1964.
http://www.moma.org/collection/browse_results.php?criteria=O:AD:E:4285&page_number=20&template_id=1&sort_order=1 [Accessed: February 13th 2011]
[60] Dahlhaus, *The Idea of Absolute Music, op. cit*., p. 28, 29.

Eggeling's vision for their *Universelle Sprache* was that of a spiritual language. Elder notes Richter described artworks as having a transcendental function.[61] Through the use of pure elementary geometric forms combined through the use of rhythm into a whole Richter seeks to draw his film into a higher realm. Richter summarises thus:

> Rhythm refers to the metaphysical domain of belief and truth. We experience rhythm intuitively. Rhythm is inwardness. Rhythm is the power of nature. Rhythm it is that forms and animates incommunicable ideas, and through which we are bound to the elementary forces of nature.[62]

When Wassily Kandinsky wrote "every work of art is the child of its time, often it is the mother of our emotions"[63] he could have been referring to *Rhythmus 21* specifically. Richter's film was the culmination of ideas of the *absolute* and a new art that were in the ether of the early twentieth century. It draws on ideas of the plastic in art as postulated by De Stijl and Piet Mondrian and ideas of the absolute in music from Eduard Hanslick through to Arnold Schoenberg and Anton Webern. It was also highly influential in the career of Oskar Fischinger (1900 – 1967) and the birth of the visual music cinema of the American West Coast in the forties, fifties and sixties through the "Art in Cinema" Screenings in San Francisco.

LICHTSPIEL OPUS I

Not all of the early visual music films produced in Germany during the interwar period were concerned with the formal counterpoint of neo-plasticism. In the spring of 1921 in Frankfurt, Germany Walter Ruttmann screened his expressionist visual film *Lichtspiel Opus I*. Despite Richter's attestation to the opposite, there is evidence to suggest that this is in fact the first screening, not only of a visual music film but also of an abstract animated film, for a general audience.[64] For many years the accomplishments of Ruttmann in relation to the visual music film were overlooked. There are several possibilities for this. Hans Richter moved to New York at the outbreak of World War Two and in his capacity as an academic at City University of New York had access to a greater audience for his writing and work. Richter also had close friendships with the rest of European art intelligentsia such as Baroness Hilla Von Rebay, the first director of the Museum of Non-Objective Art (now the Guggenheim Museum in New York), who had also fled Europe. As Eggeling was dead by this stage there was nobody to contradict his

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[61] Elder, *op. cit.*, p. 38.
[62] Hans Richter cited in Elder, *op. cit.*, p. 38.
[63] Kandinsky, *op. cit*., p. 127.
[64] Moritz, "The Absolute Film," *op. cit*.

claims as to the date and circumstances surrounding the first visual music films. William Moritz writes that Richter consistently intimated that Ruttmann began making filmmaking later than he and Eggeling did. Moreover, he suggests that Richter was also disparaging of Ruttmann's artistic credentials insisting that his films lacked a "true sense of rhythm or harmony."[65] Even the most rudimentary of viewings will attest to the fact that this is not true in a literal sense. The film is very obviously dynamic and musical, with the individual element and music *fitting together*. However, in the Neo-plastic sense of the term that concerned Richter and Eggeling, it perhaps, does not display the same strict harmonic arrangement of constituent elements or the balanced rhythmic equilibrium bound up in the principle of counterpoint.

According to Malcolm LeGrice, Louise O'Konor (author of the sole monograph on Viking Eggeling) and Moritz *Rhythmus 21* and *Diagonale Symphonie* were conceivably made as late as 1927.[66] [67] Further to this, Ruttmann, unlike most abstract artists of the period remained in Germany during the war and became caught up in the Nazi machine, editing films by infamous Nazi filmmaker Leni Riefenstahl, so in addition to Richter's skewing of history there was also a tendency by those who were aware of Ruttmann's films to gloss over or ignore his achievements. Consequently, Ruttmann, although working on the same concepts and mediums at the same time as Richter and Eggeling, was for a long time, edited out of history. This has of course been changing slowly with the recognition that many of the images in Oskar Fischinger's visual music films which I will discuss at length later in this thesis, have been garnered from Ruttmann's *Opus* series. Moreover discussion, however brief in writings by Moritz, LeGrice and A.L. Rees and the issuing of Ruttmann's fully restored films on DVD by the Centre for Visual Music in Los Angeles for the first time have also led to Ruttmann's work gaining more critical appreciation.

In addition to studying architecture and music, Ruttmann like Eggeling and Richter had also studied painting. Following the end of the Great War, in which Ruttmann served as a Lieutenant in the German Army for the duration of the fighting, he became disillusioned by painting and is quoted as saying that it no longer made sense to paint after

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[65] William Moritz, "Restoring the aesthetics of early abstract films," *A Reader in Animation Studies*. Jayne Pilling (Ed.), 1997, Sydney: John Libbey and Co., p. 221.

[66] Eggeling died in 1925 so presumably O'Konor and Moritz are referring to Richter's reconstructed version of *Diagonale Symphonie*.

[67] See Louise O'Konor, *Viking Eggeling, 1880-1925, Artist and Filmmaker:* Life and Work, translated by Catherine G. Sundström and Anne Libby (Trans.), 1971, Stockholm: Almqvist and Wiksell, Moritz, *op. cit*., and LeGrice, *op. cit*.

the war unless the painting could be set in motion.[68] He began to pursue this agenda by painting directly onto celluloid, which could be projected frame by frame over time. This resulted in Ruttmann's first film entitled *Lichtspiel Opus I: a Symphony in Three Parts* (1921). He went on to make three further films in his *Opus* series before moving onto less abstract forms of filmmaking. Inspired by Wagner's ideas of *Gesamtkunstwerk,* it is a remarkably accomplished first attempt at representing music visually. Unlike *Symphonie Diagonale* and *Rhythmus 21, Lichtspiel Opus I* was never intended to be silent. On completion, the film composer Max Butting composed a carefully synchronised score that was to be played as a live accompaniment at the cinema screenings with the classically trained Ruttmann playing the cello as part of the string quintet. Although the film functions silently as dynamic composition that demonstrates musical values, Butting's score reinforces the expressionist qualities of the visual elements of the film and imbues the film with the *third* quality that Rodgers and Kandinsky write about in relation to the marriage of sound and image.

The version that I am analysing is not Ruttmann's original thirteen-minute film. It is a Russian version, which is three minutes shorter. William Moritz, who restored the film, indicates that the film does "not seem to lack any specific *type* of imagery"[69] but is missing repetitions of images.[70] It is difficult to know exactly what Moritz means in this case as there are certainly repeated series of images or visual motifs composed of recurring images but perhaps he is referring to repeated motifs rather than individual sequences of images.

Like Eggeling, Ruttmann announces his musical framework in the title of his film but his film clearly differs from Eggeling and Richter's films. *Lichtspiel Opus I* is less rigorous and formal in its composition, enjoying a more Romantic and expressionistic tone. It is also not bound by the principle of counterpoint to govern its movement and rhythm. The film is organised into three movements with the beginning and the final movement marked by a black visual and aural silence. Traditionally, the first expository movement gives the work its character. The second movement is more expressive and lyrical movement and the final movement reiterates the first movement in a lighter form. *Lichtspiel Opus I* does not exactly conform to this standard but the three movements are clear and distinct and in many ways are probably representative of the more experimental direction that the symphonic form took in the period post World War One.

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[68] Walter Ruttmann cited in Russett and Starr, *op. cit.,* p. 40.
[69] Moritz, *op. cit.*, p. 223.
[70] *ibid.*

MOTIFS

FIRST MOVEMENT

There are a number of discernible visual motifs in the first movement that have identifiable musical attributes. However, problems arise when trying to apply titles to these motifs due to their abstract nature. Moreover, these non-figurative shapes are not codified in the same way that musical tones are codified as musical notes. It is also difficult to describe these motifs in purely abstract terms and I find it necessary at times to describe or title these figures in terms of more tangible shapes or references such as *balloon* or *brush stroke* shapes. These are perhaps not entirely in keeping with the non-objective nature of the visual music films under discussion but it is the best way that I can find for codifying visual motifs that recur throughout *Lichtspiel Opus I*.

BALLOON MOTIF

FIGURE 2.7: WALTER RUTTMANN, *LICHTSPIEL OPUS I* (1921) DEMONSTRATING THE BALLOON MOTIF, HTTP://YOUTU.BE/AHZDDMYFZN0.

An aqueous green tinted curved figure expands like a balloon inflating as the music swells and sustains open the first movement. This motif is constantly reiterated throughout the first movement with variations in timing and size. At times the balloon shapes inflate and deflate slowly as string notes attack and decay. At other times they expand and contract quickly as the image grows increasingly transparent. This physical action is a visual manifestation of musical dynamics, specifically diminuendo and crescendo.

BRUSH STROKE MOTIF

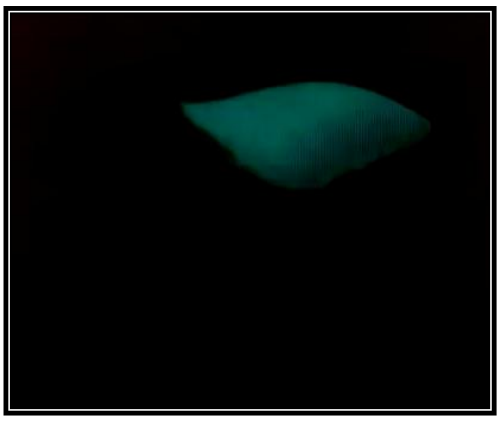

FIGURE 2.8: RUTTMANN, *LICHTSPIEL OPUS* I (1921), *OP. CIT.* DEMONSTRATING THE BRUSH STROKE MOTIF.

A figure that looks like a curved brush stroke skating in curved trajectories from one side of the screen to the other appears repeatedly throughout the film. There are many variations on this motif. The speed and rhythm of the movement varies. Often the same action is repeated many times in succession. This figure also frequently recurs in counterpoint. For example one instance of the figure will move in an undulating movement from one side of the screen to the other. A reciprocal movement follows this but from the opposite side.

COTTON WOOL MOTIF

FIGURE 2.9: RUTTMANN, *LICHTSPIEL OPUS* I (1921), *OP. CIT.* DEMONSTRATING THE COTTON WOOL MOTIF.

Figures of rough-edged cotton wool-like splodges tinted cotton candy shades of green, pink and turquoise, dance up the screen rapidly as though caught in an air stream. These shapes suggest pseudo-synaesthetic depictions of soft rounded

musical sounds. These give way to crescent shapes. These figures occur only once in both the first and final movements, unifying the movements.

PAINT MOTIF

FIGURE 2.10: RUTTMANN, *LICHTSPIEL OPUS* I (1921), *OP. CIT.* DEMONSTRATING THE PAINT MOTIF.

FIGURE 2.11: RUTTMANN, *LICHTSPIEL OPUS* I (1921), *OP. CIT.* DEMONSTRATING A VARIATION ON THE PAINT MOTIF.

Another motif that habitually returns is the figure of a curved viscous shape expanding and contracting on screen. It moves like thick paint moving down a page. The hand-tinted figure has a translucent quality as if there is a layer of gossamer lying over the surface in spite of its tacky consistency. The texture and tone of the image at times looks like the moon illuminated by the sun as it passes by in orbit.

TRIANGLE MOTIF

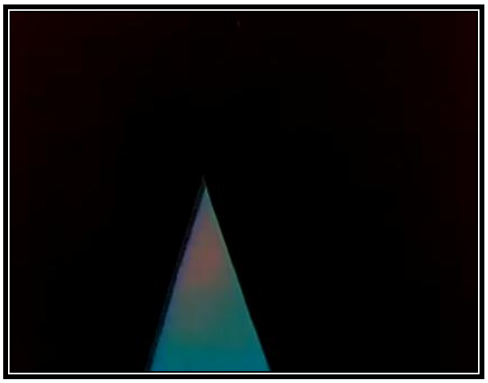

FIGURE 2.12: RUTTMANN, *LICHTSPIEL OPUS I* (1921), *OP. CIT.* DEMONSTRATING THE TRIANGLE MOTIF.

FIGURE 2.13: RUTTMANN, *LICHTSPIEL OPUS I* (1921), *OP. CIT.* DEMONSTRATING A VARIATION ON THE TRIANGLE MOTIF.

The motif of the triangle is a constant presence in this film, acting as a hard-edged foil to the soft curves of the other visual motifs. Introduced briefly towards the end of the first movement, it becomes one of the foremost motifs in the second movement. In this movement there is a constant tension between the angular pointed form of the triangle and the soft fluidity of the curved figures, finally

escalating to a full-scale battle between the structurally opposed forces. The pseudosynaesthetic qualities of the shapes imbue them with particular aggressive qualities. The angular nature of the triangle, in addition to the jarring character of its movement throughout the film lends a tension to proceedings. This tension is reinforced by Butting's score which echoes the tension induced by the onscreen battle.

BLOB MOTIF

FIGURE 2.14: RUTTMANN, *LICHTSPIEL OPUS I* (1921), *OP. CIT.* DEMONSTRATING THE BLOB MOTIF.

The final motif that is introduced in the first movement is reminiscent of a fluid paint blob. Although at a cursory glance it bears some relation to the paint motif that is discussed earlier in this section, it is on closer inspection quite different. It lacks the depth of earlier image, relying on a matte all over colour to provide its shape. The blob figure moves by a process of fluid transmutation.

SECOND MOVEMENT

Ruttmann uses the black screen as a visual silence in order to make a clear demarcation between movements. Some of the images introduced in the first movement recur in this. The images are, in general, more graphic and there is a constant tension between the menacing hard-edged triangles and gentle curves. As I mentioned earlier it is difficult to resist the tendency to describe the interaction of abstract images in anthropomorphic terms. This proved to be particularly difficult in the second movement of this film due to the nature of the interaction between the shapes. In spite of this anthropomorphising of the images being contrary to the *plastic spirit* exemplified in Richter and Eggeling's efforts it is still the method that I have found most appropriate to

describing a number of the images of Ruttmann's more playful effort. Whereas the interaction and movements of images in Richter and Eggeling's films were strictly governed by counterpoint, with the images moving reciprocally, Ruttmann's images have a direct interaction with each other. In addition, due to the quality of the movements the abstract shapes seem to be infused with character.

MOTIF OF TRIANGLE ATTACKING CURVED SHAPE

FIGURE 2.15: RUTTMANN, *LICHTSPIEL OPUS I* (1921), *OP. CIT.* DEMONSTRATING THE MOTIF OF A TRIANGLE ATTACKING A CURVED SHAPE.

It has already been established that the triangle is one of the predominant figures in the second movement but it also occurs in a separate figure in which it appears to be attacking a curved stylised balloon shape as if attempting to both taunt and escape from it, like two children playing tag in a playground. Unlike the first movement, which remains resolutely non-objective in appearance and execution, the figures in the second movement have distinctly anthropomorphic characteristics. This can be attributed to the interaction of the various shapes, aligned with the movement of the images. This movement owes less to the orchestration of forms and more to the choreography of dancing figures. This visual difference between the two movements does not negate the musical aspects of the second movement. It still retains an inherent musicality even if the images are abstract rather than non-objective.

SWIMMING FISH MOTIF

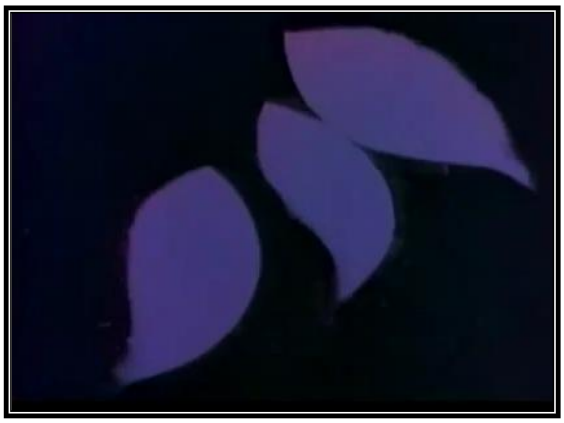

FIGURE 2.16: RUTTMANN, *LICHTSPIEL OPUS I* (1921), *OP. CIT.* DEMONSTRATING THE SWIMMING FISH MOTIF.

As the second movement progresses the images take on a nautical appearance. For example a figure of three leaf-shaped brush strokes that look like a shoal of swimming fish occurs several times in the course of the second movement

WAVES

FIGURE 2.17: RUTTMANN, *LICHTSPIEL OPUS I* (1921), *OP. CIT.* DEMONSTRATING THE WAVE MOTIF.

Following on from the maritime images of the swimming fishes, Ruttmann combines two of the images that we have previously encountered into an underwater adventure. A stylised fish playfully swims over the figure of a paint blob that has now become an undulating wave. This could be read as a form of visual polyphony with two independent musical motifs or themes.

THIRD MOVEMENT

The third movement introduces new elements to the battery of the film. The imagery becomes more intense in colour and texture. Like Schoenberg's coloured lights in "Die Glückliche Hand," Ruttmann uses colours to set the tone and mood of the third movement.

STROBE

The third movement opens with a nebulous strobe of intense colour swinging pendulously back and forth in an even rhythmical manner. This image consistently returns throughout the movement.

FIGURE 2.18: RUTTMANN, *LICHTSPIEL OPUS I* (1921), *OP. CIT.* DEMONSTRATING THE STROBE MOTIF.

RED SUN MOTIF

Foreshadowing the films of Belson and James Whitney, Ruttmann also introduces an image reminiscent of a deep red sun that looks as though it has burnt out and is in the last throes of life. This sun swings metrically through Ruttmann's tinted

FIGURE 2.19: RUTTMANN, *LICHTSPIEL OPUS I* (1921), *OP. CIT.* DEMONSTRATING THE RED SUN MOTIF.

screen sky. Eventually this motif is joined by other motifs into a polyphonous mêlée for visual dominance.

MERGING WAVES MOTIF

The next unique figure encountered in this movement is that of thick gelatinous waves, fighting and consuming each other like instruments or voices fighting each other for prominence in a musical composition.

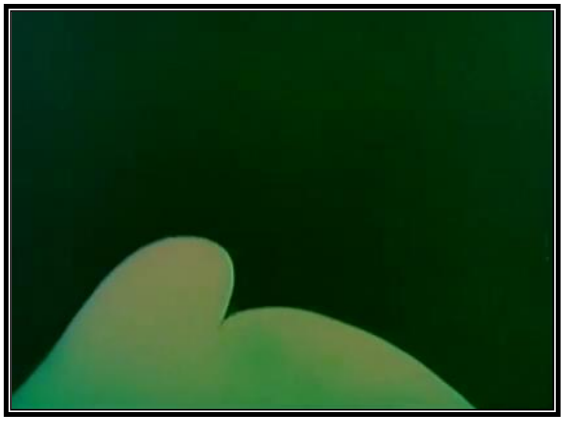

FIGURE 2.20: RUTTMANN, *LICHTSPIEL OPUS I* (1921), *OP. CIT.* DEMONSTRATING THE MERGING WAVES MOTIF.

SQUARE MOTIF

The appearance of the square figure is a departure from the existing figure. Visually it exists somewhere between the angles of the triangles and the curves of the aquiline images. It repeats itself over and over again on the same downward diagonal trajectory.

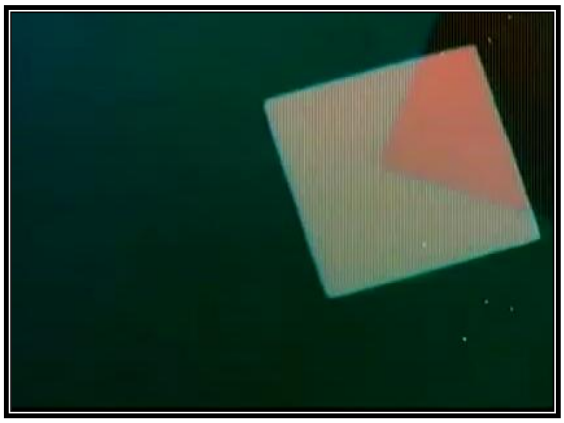

FIGURE 2.21: RUTTMANN, *LICHTSPIEL OPUS I* (1921), *OP. CIT.* DEMONSTRATING THE SQUARE MOTIF.

FURTIVE BALLOON MOTIF

One of the motifs in the third movement is particularly incongruous. The cool aqueous tint makes for an odd juxtaposition with the force of the red strobes and suns. In this motif a fluid balloon type figures appears to be trying to escaping from its hiding place behind a square that blends in with the background in order to frolic with a white moon in the sky. This whimsical interlude changes the mood of the movement but seems appropriate in the greater scheme of the film.

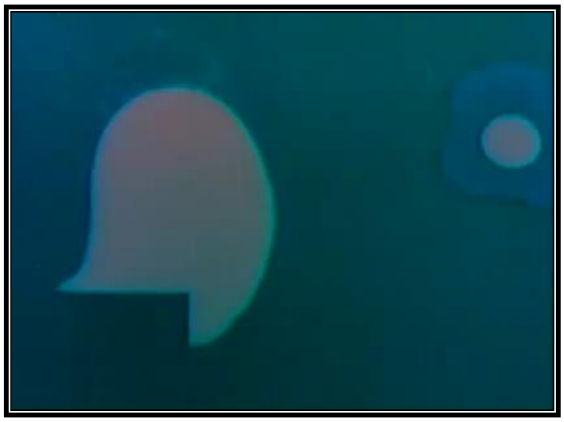

FIGURE 2.22: RUTTMANN, *LICHTSPIEL OPUS I* (1921), *OP. CIT.* DEMONSTRATING THE FURTIVE BALLOON MOTIF.

INTERACTIVE STROBE MOTIF

The figure of the swinging strobe returns in a new incarnation. This time it is joined by other motifs that we have encountered earlier in the film. In some ways the other shapes, such as the triangle and viscous paint shape, are relegated from motifs to figures, as like a musical figure they are operating in the background unlike a dominant motif that always exists in the foreground of a musical compositions. The strobe is the dominant item in this overarching motif. The other

FIGURE 2.23: RUTTMANN, *LICHTSPIEL OPUS I* (1921), *OP. CIT.* DEMONSTRATING THE INTERACTIVE STROBE MOTIF.

images are forced to cede to the constant movement of the strobe, popping into view whenever and wherever it has relinquished space.

THE MUSIC IN LICHTSPIEL OPUS I

As I demonstrated earlier Eggeling had specifically designed *Symphonie Diagonale* to be screened silently. Likewise, Richter had considered the intrinsic musicality of counterpoint to be enough to sustain the concept of musicality in the visual form. In contrast, Ruttmann never had such designs with *Lichtspiel Opus I*. Ruttmann conceived the later three instalments in the four film series to be screened without a specific soundtrack in mind but the first was always intended for a musical accompaniment. German composer Max Butting wrote a carefully synchronised score in response to Ruttmann's visual orchestration that was to be performed live by a string quintet during screenings of the film. The original score in the Swedish Film Institute contains Ruttmann's crayoned sketches to the music as guides to synchronisations.

Interestingly Moritz writes that *Lichtspiel Opus I* was rarely screened after the initial screenings of 1921. Ruttmann chose to include only the subsequent three *Opus* films in the program for the *Absolute Film Show* in May 1925. It has been assumed that Ruttmann considered the film to be too primitive in relation to his later efforts. Moritz, however, insightfully offers the explanation that rather than being too primitive the film was, in fact, too daunting a prospect to perform. The musical score was integral to the film, thirteen minutes in its original form, required exact synchronisation between a live quintet and the projector. As the score was obviously so integral to the film Ruttmann probably did not see the point in screening it without a musical accompaniment.[1]

Butting was a member of the *Novembergruppe*, a group of German expressionist artists and architects, leading their musical events between 1921 and 1927. It is no great surprise to find that the score for *Lichtspiel Opus I* contains characteristics of expressionism. The term expressionism, like impressionism and minimalism was first used in connection with visual art. As pointed out earlier in this chapter expressionism sought to represent inner experience outwardly. The *Oxford Dictionary of Musical Terms* indicates that this outward manifestation of inner feelings was often concerned with "the ruthless expression of disturbing and distasteful emotions, often with a stylistic violence that may involve pushing ideas to their extremes or treating the subject matter with incisive

[1] Moritz, op. cit., p. 223.

parody."[2] These characteristics are present in Ruttmann's film. A.L. Rees writes, "Ruttmann stands somewhere between Richter's purist constructivism of abstract signs and Fischinger's fully blown anthropomorphism in which shapes and sounds evoke human sensations."[3] Indeed Rees goes so far as to suggest that there is an overt "narrative" in all of the Opus films resulting from this anthropomorphism. A *narrative* can certainly be imposed on *Lichtspiel Opus I*, specifically in the second movement but this narrative is a projection by the viewer as a way of relating to the abstract images moving on screen. In a way these anthropomorphic could be taken as a form of parody. By bestowing a sense of playfulness and character on abstract forms Ruttmann could be said to be poking fun at the often serious world of modern art in the period after the Great War. In addition, it demonstrates a levity and humour that is lacking in the black and white formal experiments of Richter and Eggeling.

The music is dramatic, romantic and expressionistic, reflecting the attributes of the visual images. There is an atonal, dissonant quality to the music. Although there is a tight synchronisation between the images and the music the dominant musical motif does not correspond exactly to any visual motif in particular. In other words no visual motif has a musical leitmotif of its own.[4] The first movement is arranged in sonata ternary (ABA) form both visually and aurally. The first section, section A is the exposition and introduces the themes of the movement. It opens with dramatic low strings rumbling over the titles. Tense and dramatic, it sets an ominous yet darkly romantic tone, the attack and decay of the music matching the rhythm of the balloon form as though the shape and the forms are breathing in unison. A solo violin melody comes in over the dissonant sustained strings as the visual motifs of the brush strokes and cotton wool balls appear on screen. The mood of the movement changes as there is a transition to section B, the development. The music and imagery are more reflective and melancholy as brush strokes glide across the screen, balloon forms inflate and deflate while syrupy paint forms seep from the corners of the screen. Triangular forms begin to appear as the music becomes more angular and more disjointed. Solo string instruments start to battle for the supremacy of their individual melodies as mirrored brush strokes brush against each other and repel. The instruments reach a compromise as they each reiterate the dominant theme, gathering pace as semi-circular brush stroke gamble over the screen like spring lambs and brush strokes cavort

[2] Latham, op. cit., p. 64.
[3] Rees, op. cit., p. 39.
[4] The term leitmotif refers to a musical theme that recurs in music, usually to represent a particular character. In the case of *Lichtspiel Opus I* or an abstract film this could be referring to a particular shape.

with each other. The original sequence of motifs returns as section A, the recapitulation, restates the subject introduced in the first section to create a sense or homogeneity and unity between the sections in the first movement.

The second movement is slower, even more dissonant and angular than the first. There is a more staccato rhythm to the notes that contrasts with the long sustained notes in the previous movement. At the same time, however, there is a struggle between instruments to attain supremacy over the rhythm, with one instrument attempting to dominate the other. As the tension in the music builds a battle ensues between instruments. One instrument plays a theme and another responds to it, just like the fight for supremacy between the shapes on screen.

The third movement is not in ternary (ABA) form. It is slower with long, lyrical sustained notes. The mood is more romantic than the other two, yet there is still dissonance with a dark undertone present. It opens with a sad, lone instrument playing the main theme. The held vibrato of the notes echoes the even pendulum swings of the visual motifs. The music becomes more dramatic as the square motif speeds up, getting faster and faster. The music changes again as the pendulous strobe returns. It is slow, quiet and pensive but suddenly increases in pace, volume and drama until swelling to a climax and ending suddenly.

Ruttmann's film is a more sophisticated affair than Richter and Eggeling's. Ruttmann undoubtedly achieved a greater command of production techniques than either of his counterparts. While Richter and Eggeling relied on simple cut outs that they had other people photograph, Ruttmann used oil paints on glass plates beneath an animation camera, shooting a frame after each brush stroke or alteration in his making of *Lichtspiel Opus I*. In addition, Ruttmann had managed to introduce colour into *Lichtspiel Opus I* by toning and hand-tinting the negative. Although Ruttmann attached little importance to the relationship between tone and colour, a crude correspondence can be made between the tinting and mood of the certain sequences. For example the blue toned sequences are often more melancholic than the intense dramatic red ones. The colour is serving to create a mood, much like the coloured stage lighting in Schoenberg's expressionist drama "Die Glückliche Hand" (1910).

Rees writes that with the *Opus* films Ruttmann was taking up Richter and Eggeling's programme for a "universal language" as they set out in 1919. This could be considered true in one respect. Ruttmann adopted Richter and Eggeling's idea of music as the universal language, capable of appealing to all people on an immediate level.

Furthermore he makes full use of their organisational principle of counterpoint, as both filmmakers would subsequently employ in their own visual music films and had already been using in their scroll paintings. Ruttmann goes further than Richter and Eggeling ever would in his use of musical frameworks in his structuring of images. He not only managed to successfully employ the principle of counterpoint but he managed to successfully take the relatively complex structural idiom of sonata forms and apply it to the visual structure. Ruttmann was so effective in his use of ternary form that it translates directly into corresponding musical one as demonstrated by Butting's musical accompaniment, while still maintaining strict synchronisation. Butting's score can actually stand alone as a piece of absolute expressionist chamber music in traditional classical form. I would argue that it is perhaps Ruttmann's expressionistic *Lichtspiel* films that have had the greatest visual influence on the films of Fischinger and Lye. Even Jordan Belson's more cosmic offerings seem to contain visual references to figures found in the *Lichtspiel* series.

NORMAN MCLAREN

> "… [W]e are not only at the beginning of a new stylistic phase, but at the same time on the threshold of the development of a completely new Art. An Art with forms which signify nothing, represent nothing and remind us of nothing, which arouse our soul as deeply and as strongly as music has always been able to do.[5]
>
> August Endell (1871 – 1925)

This chapter has so far established that the formal and spiritual structures of absolute music proved to be the ideal model for the visual music film. It has, in addition, demonstrated that varying interpretations of the absolute pertaining to music evolved over time. The visual music film underwent a similar development in line with musical trends. During the 1960s Scottish animator Norman McLaren undertook a series of inquiries into the nature of the line that culminated in three films, *Lines Vertical* (1960), *Lines Horizontal* (1962) and *Mosaic* (1965). Although McLaren has always been associated with innovation in animation technique and aesthetics, often times his more formal concerns have remained overlooked, underexplored, or even dismissed by critics such as Malcolm LeGrice. This section seeks to readdress this by looking at the *Line* trilogy in relation to the development of minimalist tendencies that emerged in both art and music in the twentieth century. Further to this McLaren has asserted that the structure of his *Line* films is influenced by the

[5] August Endell, "The Beauty of Form and Decorative Art," *Art in Theory 1900-2000: An Anthology of Changing Ideas*, Charles Harrison and Paul Wood (Ed.s), 2003, Oxford: Blackwell Publishing, p. 59

structure of Indian music, a music whose formal construction is intrinsically bound to notions of the spiritual. This section will draw on these notions in order to examine how the process of simplification intrinsic to Indian music and by extension minimalism, across the arts, has an innate spiritual quality to it that can allow McLaren's films to function on both a formally and spiritually absolute level simultaneously. McLaren's *Line* films serve as a transitional point between the formal concerns of the German modernist visual music filmmakers and the more spiritual cosmic considerations of the American West Coast filmmakers.

THE MOVE TOWARDS MINIMALISM IN MUSIC IN THE 1960S

The first two films in the series, *Lines Vertical* and *Lines Horizontal*, were an experiment in "pure design"[6] with the aid of Evelyn Lambert, McLaren's frequent collaborator at the National Film Board of Canada. McLaren and Lambert distilled the process of animation down to its most basic elements, form and rhythm, to see if it was possible to make a film with a single line moving at varying speeds. Lines that were 19" in length, the length of Lambert's ruler, were engraved directly into the emulsion of the film. At the end of each 19" segment the line would change direction marking a natural break in the action. The program notes for both films states that McLaren and Lambert "reduced picture and action to the bare minimum required to hold the eye and delight the senses. What you see is simply a sheaf of lines, constantly gyrating, grouping harmoniously on the screen in accord with music."[7] From this statement three conclusions can be drawn. Firstly, McLaren was interested in exploring animation in its purest form. Secondly, McLaren was trying to create films that could appeal to audiences at a universal sensory level and finally, the films had an inherent musical rhythm to them that could allow musical soundtracks to be synchronised to them on a later occasion.

[6] National Film Board of Canada (N.F.B.C), "Lines Horizontal and Vertical," *Film as an Art catalogue*, 1961, p. 1.

[7] *ibid.*

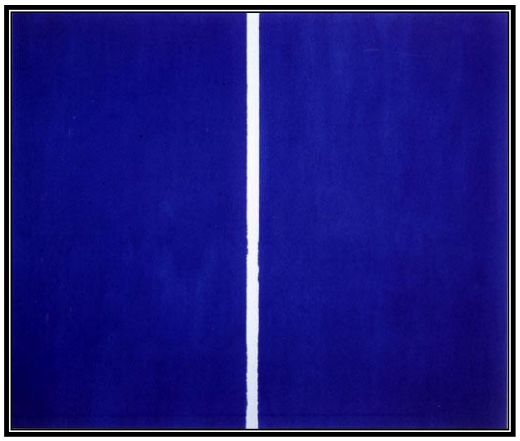

FIGURE 2.24: BARNETT NEWMAN, *ONEMENT VI* (1953), HTTP://NONICOCLOLASOS.WORDPRESS.COM/2008/02/29/KONST-FOR-DEN-UNIVERSELLA-MANNISKAN/.

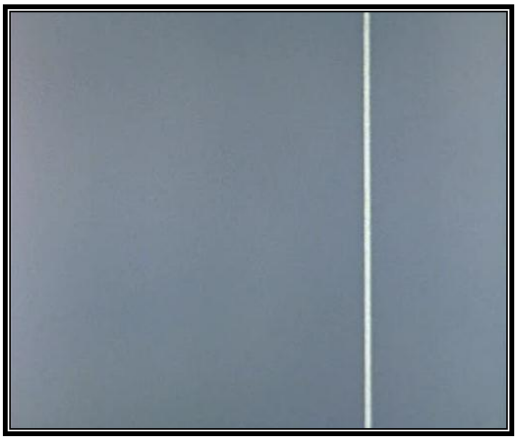

FIGURE 2.25: STILLIMAGE NORMAN MCLAREN, *LINES VERTICAL* (1960), NORMAN MCLAREN: THE MASTER'S EDITION [DVD]. 2006, CA: N.F.B.C. NOTE THE SIMILARITY OF THE COMPOSITION WITH NEWMAN'S ZIP PAINTING.

These concepts were not unique to McLaren and his three *Line* films clearly belong in the lineage of minimalist art and music that emerged in the twentieth century. Although they perhaps do not draw a conscious or direct influence from these works, in many ways the asceticism of McLaren's *Line* films was mirroring a shift towards a simpler aesthetic in music and the plastic arts. The most obvious visual and philosophical counterpart for the aesthetic and structure of these films can be found in the *zip* paintings of American painter Barnett Newman (see figure 2.24 and figure 2.25). Newman created a series of paintings with vertical bands that he referred to as *zips*. These zips vertically traversed a coloured canvas, breaking the *void* of the space. McLaren's lines serve the same function. The separation of the moving lines in both *Lines Vertical* and *Lines Horizontal* creates divisions of space within the area of the frame that was once vacant just as Newman's vertical bands do in his *zip* paintings but with the added element of temporality. It is this aspect of time that makes minimalism in music a particularly apt reference point for a reading of McLaren's *Line* films.

Music in particular underwent a process of simplification during the 1960s. Musicians were endeavouring, in the words of musicologist Jonathan W. Bernard, to "create a viable alternative to (what they came to see as) the needless and overly intellectual complexities of serialism."[8] They were also looking for an alternative to indeterminacy (the idea that a performer has the freedom to interpret a composer's work during a performance) in the work of composers such as John Cage, Milton Babbitt and Karl-Heinz Stockhausen. This led to American composers including La Monte Young,

[8] Bernard, *op. cit.*, p. 97.

Terry Riley, Steve Reich and Philip Glass developing a form of music that became known as *minimalism*. This form of music is highly influenced by Eastern music and relies on static tonal structures, additive rhythms, textural consistency and transparency, and constant thematic repetition, most typically finding expression in compositions that unfold slowly over extreme lengths of time, without dramatic incident or developmental goal.[9] Another attribute is a reduced content, which is reflective of the influence of Eastern thought that advocated an ascetic approach to life. In addition, it is often marked by the use of loops, phasing and tonality.[10]

The Fluxus group of minimalist musicians, perhaps best represented by La Monte Young, were the most significant in the transition to minimalism. Fluxus was an international movement of artists, composers, curators and designers that emerged in New York in the early 1960s and was involved in the exploration of cross-disciplinary interactions between traditionally disparate disciplines. In his 1972 book *Experimental Music: Cage and Beyond* British Minimalist composer Michael Nyman writes that the Fluxus composers "reviewed multiplicity, found its deficiencies, and chose to reduce their focus of attention to singularity."[11] This pursuit of singularity in composition led them to adopt various strategies: the minimisation of indeterminacy, an emphasis on the surface of the work and a concentration on the whole rather than the parts of the composition.[12] These strategies are all present in McLaren's *Line* films. As an animated entity imprinted on film stock, there is a certain lack of indeterminacy inherent in them. McLaren has determined what it is the audience sees in each projection of the reel. His use of the line moving over the flat plane of the screen in his *Line* films places an emphasis on the surface of the work, just as Newman does in his *zip* painting by attempting to remove any signs of brush strokes. The films are flat and two-dimensional in appearance. They are repetitive due to their reliance on the single thematic image of the line. Lastly, there is an emphasis on the wholeness of the composition. There is no discernible edit in the completed work. The movement of the lines appear continuous and unbroken for the duration of the films.

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[9] Morgan, *op. cit.*, p. 423.

[10] The term phasing denotes the "effect achieved when two instrumentalists or singers perform the same musical pattern at different (slightly increasing or decreasing intervals of time, moving in or out of phase." (Latham. 2004. p. 139). It is closely associated with work of Steve Reich in compositions such as "Music for 18 Musicians" (1974-76), "Piano Phase" (1967) and "Violin Phase" (1967).

[11] Michael Nyman, *Experimental Music: Cage and Beyond*, 1999, Cambridge: Cambridge University Press, p. 119.

[12] Bernard, *op. cit.*, p. 97.

A newspaper article profiling McLaren during the 1950s quotes McLaren as stating that his experiments with "pure design" were "to give the intellect a rest."[13] This article pre-dates the *Line* films by a decade, and in many ways, the *Line* films are among his most aesthetically intellectual inquiries, yet one can see his point. By reducing the film to the straight line McLaren is freeing it from the burden of representation and allowing the film to appeal to the audience on an emotional and aesthetic level. This not only reflects the Eastern philosophy behind minimalism but also echoes architect August Endell's ideas on beauty of form and the nature of the line at the end of the nineteenth century. Endell proposed the straight line to be "not only mathematically but also aesthetically superior to all other lines"[14] due to its unchanging nature and constancy of direction. He also posits that particular lines have specific characteristics. Thin long lines invoke feelings of speed in the viewer, whereas a thickening of the width of the line has the quality of slowing the motion down as it take longer for our brains to perceive a thick line over a thin one due to the increased amount of information to be processed. McLaren plays on this idea of the ability of the line to elicit particular emotions in the viewer by introducing *actual* movement and rhythm into the lines through the process of animation. Through the process of speeding up the movement of the lines and presenting a multitude of lines on screen simultaneously in *Lines Vertical*, McLaren creates a sense of tension and unease in the audience, particularly as the lines appear, at times, to be skewed and off kilter.

Lines Horizontal explores the perceptual effects associated with the line even further. It came into being through McLaren's desire to see what would happen if a change of direction was applied to *Lines* Vertical (see figure 2.26). McLaren had the vertical lines from *Lines Vertical* printed horizontally using an optical printer. Although the essential components of the first film remain, it is, in effect, an entirely different film. The effect of the horizontal line on the perception of the viewer is remarkable. One gets the impression that the film is calmer than its vertical brother and that gravity has a role in the downwards movement of the line. The line seems to be fighting against the earth's pull in order to ascend the screen even though the rhythm of the lines is exactly the same as *Lines Vertical*. The washes of colour in the background create natural horizon lines and the lines are like waves lapping over the screen. The undulation of the lines in this film has a soft narcotic effect in comparison to the sharp and, at times, frenetic energy of *Lines Vertical*.

[13] *Commonwealth Today*, *op. cit.*, p. 18.
[14] Endell, *op. cit.*, p. 60.

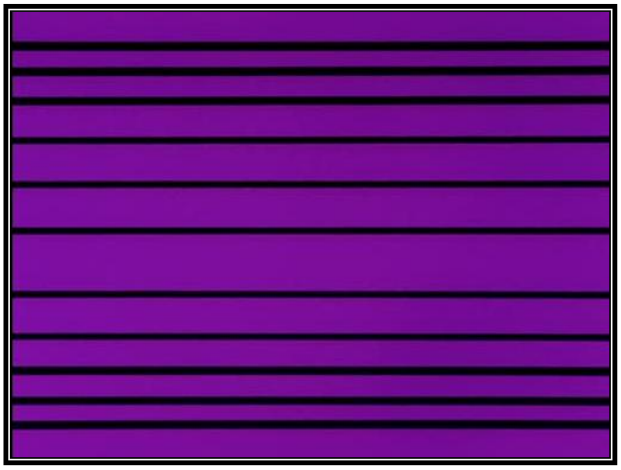

FIGURE 2.26: STILL IMAGE NORMAN MCLAREN, *LINES HORIZONTAL* (1962), NORMAN MCLAREN: THE MASTER'S EDITION [DVD], 2006, CA: N.F.B.C. DEMONSTRATING THE HORIZONTAL ARRANGEMENT OF LINES.

The rhythm and formal arrangement of all three *Line* films is very controlled and restrained. By virtue of limiting the length of the lines to the span of a 19" ruler and therefore the time that the lines remain on screen, McLaren was aware of the visual and rhythmic outcome of the film before completing it. As the films progress there is an additive effect as new lines are added to the composition. This additive arrangement has a counterpart in Philip Glass's musical composition "Music in Fifths" (1968) where there is a gradual lengthening of bars through the addition of extra musical material. Glass asserts that this is to diminish the likelihood of the listener recognising the new notes as separate elements.[15] They instead become integrated into the whole unit of the composition. This happens partly because the notes retain the same timing as the preceding notes and partly because they are, in actuality, simply repetitions of the notes that have already been used. McLaren's supplementary lines are, like the additional notes in "Music in Fifths," easily subsumed into the whole unit due to their maintenance of the characteristics of the original line. In contrast to Glass's approach to lengthening the timing of the bar to incorporate additional notes, McLaren incorporates additional lines into the same unit of time, increasing the compositional material rather than the timing. This does not diminish the additive effect but at times, due to particular characteristics of the line, which are outlined above, it gives one the illusion that the film is speeding up due to the volume of material present within the film frame.

Bernard suggests that there was a shift in emphasis from composition to arrangement in minimal art and music. He considers the term arrangement to "imply a preconceived

[15] Philip Glass, *Music by Philip Glass*, 1987, New York: Harper and Row.

notion of the hole"[16] and the term composition to mean "the adjustment of the parts; that is their size, shape, colour, or placement, to arrive at the finished work, whose exact nature is not known beforehand."[17] Glass notes that his ideas about the opposition between composition and arrangement and especially his ideas about musical time were acquired from his study of Indian music.[18] Indian music is formed from the assembly of a larger whole from a series of smaller values. This Eastern idea functions in opposition to the Western idea of dividing a particular musical whole into smaller values, like bar lines dividing up a staff. As I mentioned at the beginning of this section McLaren asserts that he based the form of his *Line* films on the structure of Eastern music.[19] There is a definite sense that these films are assembled rather than composed.

Bernard also asserts, in relation to minimalist music and minimalism in the plastic arts, "the simplification inherent in reducing the number of parts in a work also seems very much related to the spiritual, meditative qualities of minimalism: simplification in the service of the search for truth."[20] In 1931 artist Hans Hofmann commented on the innate spirituality of the line, one of the simplest compositional elements open to McLaren.

> The width of a line may present the idea of infinity... Tension and movement, or movement and counter-movement, lawfully ordered within unity, paralleling the artist's life-experience and his artistic and human discipline, endow the work with the power to stir the observer rhythmically to a response to living, spiritual totality.[21]

The minimalism and repetition of the lines in the *Line* films can be read as an expression of the *infinite*. There is a lack of devices common to western music, art and film such as contrast opposition, argument, climax, patterns of tension and release (although there is a quasi-illusionistic sense of tension in the first two *Line* films, partly induced through the musical accompaniments) and a sense of development that are lacking not only in the *Line* films but also in minimalist music and art. Bernard views this use of repetition and a lack of devices traditionally applied to the structure of time as lending minimalist music the impression that time has "stopped altogether."[22] There are moments when McLaren's films appear to reside outside of *clock time* as the viewer is drawn into the metronomic rhythm of the lines.

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[16] Jonathan W. Bernard, "The Minimalist Aesthetic in the Plastic Arts and in Music," *Perspectives of New Music, Vol. 13, No. 1,* Winter, 1993, p. 101.

[17] *ibid.*

[18] Glass, *op. cit.*, pp. 36-37.

[19] Norman McLaren, "Film Notes," *Norman McLaren – The Master's Edition* [DVD], 2006, Canada: National Film Board of Canada.

[20] *ibid.*, p. 105.

[21] Hans Hofmann, *op. cit.*, p. 373.

[22] Bernard, "The Minimalist Aesthetic in the Plastic Arts and in Music," *op. cit.*, p. 106.

In his essay "Aspects of Cosmological Symbolism in Hindustani Musical Form" Robert Sims writes that Indian music makes explicit the relationship between music and the spiritual with almost all facets of Indian culture founded on principles of the transcendent and unified by an "awareness of the cosmic hierarchy."[23] Renowned sitar player Ravi Shankar reinforces this interconnection between music and spirituality by asserting:

> music can be a spiritual discipline on the path to self-realisation, for we follow the traditional teaching that sound is God - Nada Brahma: By this process individual consciousness can be elevated to a realm of awareness where the revelation of the true meaning of the universe - its eternal and unchanging essence - can be joyfully experienced. Our ragas are the vehicles by which this essence can be perceived.[24]

I am not suggesting that the *Line* films are exact visual manifestations of Indian music, merely that McLaren, like many artists and musicians, has appropriated certain philosophies and structures as a basis for his formal and aesthetic inquiries. As composer John Cage writes:

> The composers who today wish to imbue their music with the ineffable, seem to find it necessary to make use of musical characteristics not purely Western; they go for inspiration to those places, or return to those times, where or when harmony is not of the essence.[25]

Even though McLaren and the minimalists may have turned East for inspiration they still remain within a recognisable Western aesthetic manifested through a minimalist one.

The comparison of McLaren's films to minimalist music by way of traditional Indian music is not unfounded. A few years prior to commencing work on *Lines Vertical*, McLaren had spent some time in India running a UNESCO sponsored audiovisual course in New Delhi. This does not necessarily mean that there is an underlying Indian musical philosophy in McLaren's *Line* films but there are still notable semblances of Indian doctrine present in McLaren's films as noted by Indian critic Krishna Chaitanya following the screening of the first two *Line* films in Indian in 1963:

> There is an astonishing affinity between the Indian intuition about music and his [McLaren's] creative experiments and the clarification of that affinity, even

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[23] Robert Sims, "Aspects of Cosmological Symbolism in Hindustani Musical Form," *Asian Music, Vol. 24, No. 1,* Autumn, 1992 (Winter), 1993, p. 62.

[24] Ravi Shankar, "On Appreciation of Indian Classical Music," 2006, The Ravi Shankar Foundation, http://www.ravishankar.org/indian_music.html.

[25] John Cage, "The East in the West," in *Asian Music, Vol. 1, No.1*, Winter, 1968-1969, University of Texas Press, p. 18.

> if it be a coincidence, is a good way of beginning the study of his original contribution.[26]

Further to this, Chaitanya writes that the drone that runs throughout a piece of Indian music stands for "Being, the timeless, eternal, unchanging background of all things – their origin, sustainer and goal."[27] The drone in Indian music is a constant unchanging pulse that undergirds the entire Indian musical structure. The melodic line of the raga in combination with the changing tempo of the talas (rhythmic patterns) is always looking "inwards"[28] to a sense of unity and constancy created by the drone so that the music is simultaneously undergoing the dual processes of both being in existence and coming into existence.

Something similar is occurring in *Lines Vertical* and *Lines Horizontal.* Each line in both films generates an identical line; one line becoming two, two becoming three and so on until a multiplicity of lines oscillates on screen. Although the lines move in a linear trajectory, the structure of the films is in fact circular, just as in Indian music, which works in cycles, with the lines of the film returning to the single static primordial line from whence they came. The lines are, just like Indian music, at once undergoing the process of *being* and *becoming*.

There is no art form more associated with the *sublime* or transcendent than that of music so it is no great stretch for McLaren to compare his *Line* films to music. As this thesis has demonstrated, since the earliest abstract animation of Richter, Eggeling and Ruttmann, music due to its temporal and ineffable nature has served as the perfect paradigm for the structure of abstract film. The universal language of *absolute* music not only provided the ideal conceptual basis for abstract animation, but the late nineteenth century formalist debate in music over absolute and program music also established a theoretical precedent for a discourse on abstract animation.

As noted earlier, musical philosopher Lydia Goehr makes the point that the distinction between the formal and the spiritual levels of music functioned on a worldly level but not on a spiritual one. If absolute music was allowed to function on both levels, it could be both transcendent and purely musical at the same time.[29] This concept can of course be extended to the musical compositions of the minimalist composers but it can just as equally be extended to not only minimalist painting and sculpture but also the

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[26] Krishna Chaitanya, "The Creative Film Art of Norman McLaren," *Screen (India)*, June 14th 1963, p. 2.

[27] *ibid.*

[28] *Ibid.*

[29] Goehr, *op. cit.*

minimalism of McLaren's trilogy of *Line* films. These three films can be read entirely on a formal level as an exercise in *pure* animation, the moving lines taking the place of the musical tones in instrumental music, but they can also function on a spiritual level, striving to express the ineffable.

The *Line* films should be taken as a series, each film building on principles established by the one that came before it. *Mosaic* the third and final film in the series is the synthesis of McLaren's experiments with the line in the preceding two films. It is essentially a rumination on what would happen if both *Lines Vertical* and *Lines Horizontal* were presented simultaneously on screen. McLaren was superimposing two pre-arranged films to create a new one. This film is not as straightforward as the other two. Although each film worked individually, confusion ensued when they were superimposed on each other, as there were simply too many lines on screen. The sense of wholeness and timelessness presented in the earlier films was eroded as the aesthetic changed from one of parity and asceticism to one that was overwhelmingly busy and moved away from the pared down structure of Indian music. McLaren became less concerned with the

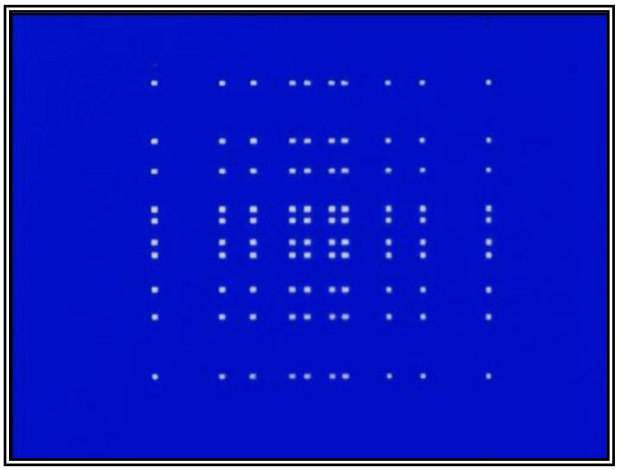

FIGURE 2.27: STILLIMAGE NORMAN MCLAREN, *MOSAIC* (1965), NORMAN MCLAREN: THE MASTER'S EDITION [DVD], 2006, CA: N.F.B.C.

superimposition of the two films and began to focus on what happened at the intersections. Consequently, *Mosaic* became a film about what happens between the lines rather than the lines themselves.

McLaren was always pre-occupied with what happened between the frame lines of a film stating:

> Animation is not the art of drawings that move but the art of movements that are drawn. What happens between each frame is much more important than

> what exists on each frame... Animation is therefore the art of manipulating the invisible interstices that lie between frames.[30]

Mosaic is in many ways the most literal representation of this idea and is similar to the search for microtonal intervals, the musical intervals that exist in between the standard twelve notes of the Western octave. These tones had long been in use in Eastern music but their use in Western art music was a phenomenon that arose in the twentieth century as composers such as John Cage and La Monte Young began to look *East* for inspiration.

It must be noted that I have chosen not to discuss the musical soundtracks for the first two *Line* films. This is because I consider them to have been extraneous to McLaren's carefully constructed visuals. Even though these films have a musical structure one could argue that McLaren was more concerned with the design of the visual aspects of these films than the soundtrack. The soundtracks were composed on completion of the films and do not entirely reflect the minimalist aesthetic of the visual orchestration. While it is true that Butting did compose the score for *Lichtspiel Opus I* on completion of the visual aspect of the film but it was so carefully constructed and captures the mood of the visual composition so perfectly that appears to fuse with the images to create a total artwork. Pete Seegar's soundtrack for *Lines Horizontal* in particular introduces patterns of tension where none exist in the structure of the visuals. The sound and image in *Mosaic* for which McLaren created his own soundtrack, on the other hand, coalesce into something greater than their parts and in some respects McLaren found his own method for reflecting the microtonality of the images in his musical accompaniment to *Mosaic* by engraving his sounds directly onto the optical soundtrack of the film stock. His essay "Animated Sound on Film," first published in a pamphlet issued by the National Film Board of Canada in 1950, demonstrated that McLaren had achieved an inordinate level of control over the production of the optical soundtrack. McLaren manages to capture microtones between tones just as he manages to capture the intersections between lines.[31] Reflecting the constant shape of the small squares that make up the visual mosaics of the film, the glitches impressed on the soundtrack do not vary in pitch or length. The rhythm of both the visual and aural track comes from the successive addition of these mosaic images and glitches to each other over the course of the piece. In *Mosaic* it is the duration of the silence of the visual or aural notes that decreases or increases, not the duration of the actual note.

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[30] Norman McLaren, "The Philosophy Behind this Machine," *Le Cinema: Image par Image.* (n.d).
[31] McLaren, "Animated Sound on Film," *op. cit.*

The best musical reference for this can be found in Philip Glass's rhythmic composition "1+1" (1968). This piece in many ways encapsulates the core of Glass's musical philosophy, acting as a blueprint for the structure of most of his minimalist works. "1+1" is designed for a single player who taps a rhythm on an amplified surface. This rhythmic ostinato that underlies the continuity of the composition is derived from two rhythmic figures of any duration that may be combined in any way. Unlike in "Music in Fifths" or *Lines Vertical* and *Lines Horizontal*, which I referred to earlier, there is no sense of the duration of the bar increasing in length. The structure of *Mosaic* almost seems to be an inversion of the other two *Line* films. The spaces between notes and points merely seem to shrink in duration.

McLaren's *Line* films demonstrate the development that the abstract animation has undergone in tandem with trends in music and visual art. McLaren's films embody many of the traits of Indian music and American minimalist art and music that were rife on the North American continent during the 1950s and 1960s. Reflecting a move towards an aesthetic that was simpler and more minimal, McLaren reduces his visual forms to the most basic expression open to him – the straight line. By concentrating on this constant and unchanging basic unit in *Lines Vertical* and *Lines Horizontal* and the points that occur between the lines in *Mosaic*, McLaren frees himself up to focus on specifically musical orchestration and allows the films to function on a purely formal level. At the same time however, all three films, due to their structures and philosophies drawn from the tradition of Eastern art music, can also be read on a spiritual level that makes a connection between the lines and life itself. *Mosaic* especially seems to have a particular spiritual resonance. Even though it also functions on a formal level, it is effectively a microtonal film. It is a film that is essentially looking at what is happening between the lines and by extension the point at which *being* and *becoming* converge.

In sum, this chapter has scrutinised the development of absolute music in the nineteenth century. It has demonstrated that absolute music, not only came to be considered a legitimate musical form, emancipated from the need for extramusical text or concept but also became the ideal universal language under the Romantics who considered it to be the art to which all the others such aspire due to this common appeal.

The legitimisation of absolute music in the nineteenth century created a framework for the development of the visual music film but, as this chapter has demonstrated, this alone was not quite the match to light the fuse that fired that start of the movement. It took

the explosion of World War One combined with the growth of cinema to blast away prevalent artistic models and ignite a new regime free from nationalism and ideology. The Neo-plastic black and white formal abstractions of Richter and Eggeling were the first visual music films to rise from these flames in the 1920s. In a move mirroring the evolution of absolute music as set out by Goehr and Dahlhaus, there was a development from the Hanslickian formal approach of these initial visual music films to an approach that allowed the minimalist *Line* films Norman McLaren to function on both a purely formal level and a transcendent one at the same time. At the beginning of this chapter I made reference to a second category of the *absolute*, the *spiritual absolute*. It is this that I will explore in the next chapter, drawing on both categories of the absolute introduced in this chapter. I will, in addition, build on McLaren's appropriation of Eastern musical structures that are so closely bound up with notions of the spiritual by paying close attention to the work of James Whitney and Jordan Belson.

CHAPTER 3:

THE SPIRITUAL ABSOLUTE IN THE VISUAL MUSIC FILM

As established in the previous chapter, there was, in music, a move from a purely formal aesthetic of the absolute as advocated by formalists such as Hanslick to one where absolute music could function on a formal and a spiritual level simultaneously. There was also a comparable move in the aesthetic paradigm of visual music. The strict formalism of Eggeling, Richter and later McLaren were to give way to a cinema of the spiritually absolute predicated on synaesthetic correspondence and located in the West Coast of America. Visually there was a marked shift from the geometric aesthetic to a more visceral "gaseous" one. In her book *Deleuze, Altered States and Film* Anna Powell draws attention to the use of the term *gaseous* to describe the films of American West Coast filmmakers Jordan Belson and James Whitney. The term was first used by Gene Youngblood in 1970 in his book *Expanded Cinema* specifically in relation to the nebulous, esoteric imagery used in Jordan Belson's films, before being appropriated by Gilles Deleuze as a category in his discussion of American experimental cinema of the fifties and sixties.[1] Drawing on the debates surrounding absolute music set out in the previous chapter and questions surrounding the Sublime, this chapter will examine what I have termed the spiritually absolute films of John Whitney and Jordan Belson. Focusing on changing parameters of music, viewing contexts and attitudes towards 'transcendence' in the wake of the expanding American counterculture that was located in the Bay Area of California of the American West Coast, I will address how both Belson and Whitney attempt to simulate, achieve and promote expanded states of consciousness through their own unique brand of visual music by undertaking a close textual analysis of *Allures* and *Samadhi* by Belson and *Lapis* and *Yantra* by Whitney.

NOTIONS OF THE TRANSCENDENT IN MUSIC

As noted previously, although in the nineteenth century music achieved legitimacy as an autonomous form that had value and meaning in itself on a worldly level, it could also function on a spiritual level at the same time. It may have been freed from the *obligation* to embody the spiritual and infinite but it still retained the possibility of

[1] Anna Powell, *Deleuze, Altered States and Film*, 2007, Edinburgh: Edinburgh University Press, p. 110.

expressing these characteristics. Notions of the transcendent in music were bound together by a sense of spiritual awe, the Sublime. Towards the end of the eighteenth century Immanuel Kant employed the term the Sublime to make sense of our responses to particular objects or events that are too overwhelming for us to comprehend. Kant considered these overwhelming occurrences to lead us first to feelings of insignificance before being followed by a sense of comprehension of the occurrences. This idea of the Sublime is central to the viewer's perception and subsequent comprehension of the visual music films discussed in the previous chapter but is particularly important to the comprehension of the films of Jordan Belson and James Whitney.

The sublime consists of two aspects: a disturbance and the overcoming of that disturbance. We feel powerless or small because of something that is stronger or larger than us. But we also experience a feeling of pleasure that is sublime when this immense force results in happiness or understanding. Kant discerned two types of the sublime: the mathematical and the dynamic. The mathematical sublime concerns an experience that is immeasurable and overwhelming in scale and vastness such as that prompted by viewing a pyramid or a tall building. The dynamic sublime concerns an experience of devastating power by entities that have absolute power over us such as raging storms, electrical storms or tornados.

Philosopher Gilles Deleuze appropriated Kant's ideas of the sublime in his discussion of the Pre-World War Two French poetic cinema of Abel Gance (1889 – 1981) and German Expressionist cinema of the same period in his book *Cinema One: the Movement Image* in 1983. His discussion of Kant's categorisation of the Sublime into the mathematical and dynamic is pertinent to my thesis but there is a fallacy in his apportioning of the category of the *dynamic* Sublime to the work of the German formal visual music composers Hans Richter, Viking Eggeling and Walter Ruttmann. This annexing of the absolute film of Richter, Eggeling and Ruttmann to the dynamic Sublime of Expressionism is not wholly correct. I would argue the case that they in fact belong to the realm of the mathematical sublime. Deleuze applies this label to the French School of Cinema of Rene Clair and Abel Gance but in a fashion, it could apply equally to Richter, Ruttmann and Eggeling's work.

Kant explains the mathematical sublime by using the example of the pyramid. The scale of the pyramid is too much for the viewer to comprehend in one viewing. Our eyes must move from the base to the top of the pyramid. By the time our eyes have reached the top of the pyramid some of the sections of the pyramid have disappeared. Therefore we

can never fully comprehend the entirety of the pyramid perceptually. The overwhelming scale of the pyramid has proved too much for our imaginations leading to a feeling of discontent and unhappiness. Our *theoretical reason*[2] must step into resolve this feeling by coalescing the various sections of the pyramid into a unified whole. Feelings of discontent and unhappiness cede to feelings of pleasure as our sense of reason allows us to think of the pyramid as a whole even if we cannot perceive it as such. Our sense of reason has placed us above the ineffable world of the senses. In the same way, in the formally absolute visual music film, our capacity for reason allows us to make sense of the formal images that are unfolding over time.

Deleuze writes that it is imperative that our thought comprehends the movements of the mathematically Sublime film as a whole or an absolute. It is no longer time as succession of movements but time as "simultanism" and "simultaneity."[3] There is no past, there is no future; there is only the present. The absolute visual music films of the pre-world war two German modernist filmmakers exemplify this Kantian idea of time as the perpetual present and the mind understanding movements as a whole. Their work is too precise, formal and rhythmical to inspire a terrible, overwhelming sense of awe that German Expressionist cinema with its light and shadows can inspire. They reside in the mathematically sublime state of the perpetual present that Kant outlined. In *The Esthetics of Music* Carl Dahlhaus posits a similar idea. He contends that music as an aesthetic object, much like a plastic work of art, is displayed indirectly rather than immediately as it is sounding. In other words, it is experienced objectively at the end of a movement and recalled in the listener's present as a "closed whole."[4] He also contends that music as form attains its real existence at the moment when it is passed. It enters into our memories and emerges in a different state than when it was immediately present. It is this altered state due to temporal distance that Dahlhaus suggests allows music to become a plastic art form open to survey in the same fashion as the other plastic arts.[5] The absolute visual music films of Richter, Eggeling and Ruttmann, like music, are formed into a lucid totality as our theoretical reason unifies the frames and the intervals between the frames.

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[2] Immanuel Kant, *Critique of Judgment.* Werner S. Pluhar (Trans.),1987, Indianapolis: Hackett Publishing Company.

[3] Gilles Deleuze, *Cinema One: The Movement Image.* Hugh Tomlinson and Barbara Habberjam (Trans.), 1986, London: The Athlone Press, p. 46.

[4] Carl Dahlhaus, *The Esthetics of Music,* William W. Austin (Trans.), 1982, Cambridge: Cambridge University Press, p .12.

[5] *ibid.*

In contrast to the mathematical Sublime, the dynamic Sublime evokes a sense of practical reason to deal with the awesome phenomena that we perceive as frightening. These phenomena fill us with displeasure as we recognise them as devices for our destruction. A feeling of pleasure succeeds this as we realise as moral, rational beings we are greater than nature due to our humanity. Kant gives the example of God being potentially fearful but not to the virtuous man.[6] Kant considered every human being to have the capacity to experience the feelings of a moral destination but only those who are morally cultivated can *actually* experience the pleasure and transcendence of the dynamic sublime.[7] The gaseous films of John Whitney and Jordan Belson, in particular Belson's film *Samadhi* are excellent examples of the dynamic sublime in the visual music film. Although they do not require the viewer to be *virtuous* in the Christian sense there is a sense that to truly experience the mystical transcendence associated with the film one must be cultivated spiritually. *Samadhi*, in particular with its hazy intimate visceral images redolent of celestial bodies, that at times reference dying stars and violently burning suns, conjures up W.B Yeats idea of a *terrible beauty*. There is a fear that the images could consume us or at the very least cause the destruction of the celluloid such is their corporeal power but reason sets in and allows us to recognise that they are an agent for transcendence. The conditions for the sublime will be made clear by looking at the context for these films.

THE AMERICAN WEST COAST IN THE POST WAR PERIOD

The rise of National Socialism in Germany and the subsequent outbreak of World War Two prompted an exodus of the European avant-garde and art intelligentsia to the more welcoming shores of the United States. With them, they brought their European ideas and sensibilities that were seized and expanded upon by American artists. By the mid-forties such luminaries of the European avant-garde as Arnold Schoenberg, Thomas Mann, George Balanchine, Igor Stravinsky, Christopher Isherwood, Aldous Huxley and, most importantly for the visual music makers, Oskar Fischinger, were working and or teaching in the state of California. Outside of Hollywood and the American university system one of the most important events for the confluence of these two agglomerates on the West Coast was *Art in Cinema*.

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[6] Immanuel Kant, *Feelings of the Beautiful and Sublime*, John T. Goldthwaite (Trans.), 1960, Berkeley: University of California Press, p. 57.

[7] See Kant, *Feelings of the Beautiful and Sublime, op. cit.* for greater elucidation of this point.

In 1946 Frank Stauffacher, initially aided by Dick Foster, programmed the first *Art in Cinema* screenings at the San Francisco Museum of Modern Art. The initial screenings presented the films of the European avant-garde of the twenties and thirties to an American West Coast audience for the first time. Beginning with a series of ten events, the screenings continued more or less regularly for nine years. Scott MacDonald attributes the origins of Art in Cinema to the cine-club movement that had spread throughout mainland Europe and the United Kingdom in the 1920s and 1930s and accompanied the European war exiles to the West Coast in the 1930s and 1940s.

Although the Art in Cinema programs screened a reasonably diverse range of films, in many ways, the screenings were the most direct continuation of the concerns of modern art and experimental film that were being explored in Europe before the outbreak of the war. The very title, *Art in Cinema*, foregrounds the importance of art to the programming. This parallel seems to be more important to *Art in Cinema* than to its nearest East Coast equivalent *Cinema 16* which was organised by Amos Vogel in New York. *Cinema 16* was, from the outset, committed to a broad spectrum of programming and tended to screen varied programs comprised of experimental films, scientific films, educational films and documentaries while *Art in Cinema* remained dedicated, in the main, to the cause of the avant-garde art film. The evolution of the programming was essential to the growth of the visual music films of the Whitney brothers, Jordan Belson, Harry Smith, Hy Hirsh and later Stan Brakhage on the West Coast. *Art and Cinema* was envisaged by Stauffacher to serve a pedagogical function and the first two series of programs were chosen in order to provide the audience with a historical overview of the avant-garde film that had originated in Europe. Stauffacher and Foster began to include films by American filmmakers in these initial series, specifically those by American visual music makers, such as Mary Ellen Bute and John and James Whitney.

Stauffacher's two curatorial ambitions, to educate with his film screenings and then to provide a venue where American filmmakers could present their own contributions to the tradition of film as art, were quickly realised as many of the filmmakers who attended the screenings, such as Harry Smith, Hy Hirsh and Jordan Belson, began to produce films of their own that were subsequently included in the *Art in Cinema* program.[8] *Art in Cinema* was to prove crucial to the creation of both an independent film community and a visual music community in the Bay Area of California. Furthermore, it both helped to

[8] Scott MacDonald (Ed.), *Art in Cinema: Documents Toward a History of the Film Society*, 2006, Philadelphia: Temple University Press, p. 3.

kindle and document the development of a spiritually informed style of visual music film that was concerned with reproducing, embodying and stimulating expanded states of consciousness.

VORTEX CONCERTS

Another space fundamental to the nebulous aesthetic that came to be associated with West Coast visual music were the *Vortex Concerts* at the Morrison Planetarium in San Francisco. Jordan Belson began to collaborate with record company executive and electronic music composer Henry Jacobs in a series of concerts in 1957. These were in many ways the natural successors to the *Gesamtkunstwerk* experiments carried out by Arnold Schoenberg, which saw him trying to marry coloured light projections with his expressionistic drama "Die Glückliche Hand" in 1915, and Scriabin's similar efforts in "Promethée, Le Poème du Feu." Rather than attempting to merely augment a narrative the *Vortex Concerts* Belson and Jacobs were attempting to create an absolute union of music and image in real-time.

In *Allegories of Film* David E. James suggests that film "became an accomplice to the other apparatuses of sensory fragmentation and reification of the modern world"[9] by adopting a fixed monocular view point through the physical immobility of the audience in set seating directly in front of the cinema screen. The *Vortex Concerts* along with events such as the *Exploding Plastic Inevitable* of Andy Warhol and the Velvet Underground and *The Joshua Light Show* in New York served to shatter these confines of cinematic parameters by transforming the viewing experience to one where the viewing position could be opened up so much that, in effect, the spectator could theoretically be surrounded by the projected film. The program notes for the fourth Vortex concert in May 1958 states the aims of Vortex thus:

> Vortex is a new form of theatre based on the combination of electronics, optics and architecture. Its purpose is to reach an audience as a pure theatre appealing directly to the senses. The elements of Vortex are sound, light, colour, and movement in their most comprehensive theatrical expression. These audio-visual combinations are presented in a circular, domed theatre equipped with special projectors and sound systems. In Vortex there is no separation of audience and stage or screen; the entire domed area becomes a living theatre of sound and light.[10]

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[9] David. E. James, *Allegories of Cinema*, 1989, Princeton: Princeton University Press, p. 133.
[10] "Program Notes," Vortex 4, May 1958,

Richard E. James refers to this as a "dispersed rather than unified subjectivity."[11] This is certainly the case in the *Vortex Concerts* in which the audience was surrounded by a multidirectional arrangement of forty speakers that Jacobs had modified to allow him to pan sound around the room. Belson used thirty projectors including the planetarium's star and rotational sky projectors, kaleidoscope and *zoomer* projectors, strobes, slide projectors, rotating prisms as well as traditional 16mm film projectors to project his abstract images on the 65ft high dome of the planetarium. This serves to remove what James refers to as the "temporal" and "spatial matrix."[12] It also eliminates the narrative closure present in the typical film screening. The projections in the *Vortex Concerts* could essentially be entered or exited at will.

Due to the fully immersive qualities of the audio-visual combinations in the Planetarium it would seem that the audience was no longer a passive participant but was subsumed into a collective synaesthesia orchestrated by Belson, who had the ability to play his projectors like musical instruments and manipulate them to interact with the music sounding from the circle of speakers. In relation to the *Vortex Concerts* James writes:

> This opening of the optical field, and the conceptual and kinetic liberation of the spectator within it, was often construed as either analogous to or premonitory of some paradigmatic genetic shift in which the engineering of consciousness would parallel developments in the electronic communications industries...[.][13]

This is echoed by Gene Youngblood in his discussion of the cosmic cinema of Belson in *Expanded Cinema.*[14] However, in an interview with Scott MacDonald in 1998 Belson asserts that this expansion of the viewing experience owed more to the opening of the mind through Hatha yoga and meditation. Whatever his assertions to the contrary might be however, the imagery of the cosmos and astronomy nevertheless remain to be one of his main visual and philosophical influences on the content of his films:

> Back in the sixties I had this photograph of a beautiful galaxy perfectly shaped, seen on edge – a dark ring with a glowing nucleus. I put this photograph where I could see it frequently, and as a result I entered into many, many meditations on this galaxy. It taught me a lot about the universe and human life... [T]hinking about them has provided me with a galaxy-based consciousness instead of an Earth-based awareness, some sense of the Big Picture.[15]

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http://www.o-art.org/history/50s&_60s/Vortex/Vortex_4.html.

[11] David E. James, *op. cit.*, p. 134.

[12] *ibid.*

[13] *ibid.*

[14] See Gene Youngblood, *Expanded Cinema*, 1970, New York: P. Dutton and Co.

[15] Jordan Belson cited in *A Critical Cinema: Interviews with Independent Filmmakers Book 3*, Scott MacDonald, 1998, Berkley: University of California Press, p. 87.

The late fifties also saw America involved in a space race with Russia so thoughts of the cosmos and images of space were never far from the public consciousness at the time. In addition, Belson and Jacobs use of the extremely sophisticated Morrison Planetarium seems to have exerted an influence over the type of images used by Belson in his projections. Belson adapted the equipment that had typically been used by the astronomers of the Planetarium in their study of the Universe to project and manufacture his own unique celestial vision. Prior to the *Vortex Concerts* Belson had essentially been making visual music films derived from scroll paintings and graphic films that were in the vein of those he had seen by Fischinger, McLaren and Richter at the *Art in Cinema* screenings. Belson's imagery changed from hard formal monochrome images to images that now moved in real time, blended together from a number of projection sources to create layers of gaseous superimpositions. These concerts proved enormously popular and, having obviously tapped into a cultural zeitgeist on the cusp of the 1960s, light shows and *happenings* gained a cult following very quickly. At one point Jacobs and Belson were putting on three performances a night to cope with the wide cross section of crowds that were turning up.

Although these light shows had a direct influence on the imagery and synaesthetic interchange that underpinned Belson's visual music films they are in many ways a precursor to this body of work. During the Vortex concerts Belson developed techniques for producing gaseous imagery that he directly applied to his filmmaking. Belson's films are more focused in both their construction and screening contexts. Unlike the Vortex concerts, which could be entered and excited at will by the participants, Belson's films were expressly designed to be viewed linearly from beginning to end. In spite of this the Vortex concerts, can be viewed as Belson's first steps towards an audiovisual journey to enlightenment.

THE MYSTICAL EXPERIENCE ON THE WEST COAST

Eastern religions such as Buddhism became valuable resources for filmmakers on the American West Coast in the 1960s. This is not only because they carried valuable cultural currency in that locale but as James points out the "emphasis on vision in meditation"[16] made it easy to adapt the spiritual function to the screen. Belson and Whitney began to apply their own brands of West Coast spiritualism to the formal graphic

[16] David E. James, *op. cit.*, p. 128.

visual music film exploring a tension between the mystical and the formal. Whitney and Belson's work extended the graphic visual music tradition of Fischinger, Richter, Eggeling and Ruttmann to "allow reference to interior or transcendental realities."[17]

Although the *Vortex Concerts* pre-date the rise of psychedelia in the 1960s, equivalencies can be made between the images used in the *Vortex Concerts* and the film work of Belson and Whitney. Further to this, as I made reference to in the previous section, many of Belson's images were influenced by cosmology and astronomy but in the case of the film work of both Belson and Whitney a parallel can be drawn with the growing popularity of psychotropic drugs and alternative religions in American counterculture especially on the West Coast of America.

With the rise in popularity of psychedelic drugs, specifically LSD, many scientific studies began to emerge on the psychological similarities between particular drug induced experiences and mystical ones. Special hallucinogenic agents such as plants, mushrooms, drugs and alcohol had long been used sacramentally in world religions in order to facilitate communion with the Gods or to gain access to a higher spiritual power. This can be seen for example in the use of the hallucinogenic drug peyote by the North American and Mexican Indians in their religious rituals. Belson and Whitney were both converts to Eastern religions and in their search for a mystical experience turned both to psychedelic drugs and yogic meditation. I would suggest that their film work functioned as a third element in their quest for this mystical experience. In addition to serving as a representation of the images that occur during such an experience the physical process of producing the mystical film images is a way for the filmmakers to achieve this experience. Moreover, the completed films could potentially be considered as aids to achieving this higher state of consciousness so desired by the filmmakers.

Many of the images found in the films of Belson and Whitney that I am focusing on in this chapter contain various figures and characteristics that are typically encountered by subjects in the midst of a mystical experience. In his article "Drugs and Mysticism" psychiatrist, church minister and PhD supervisee of Timothy Leary[18] Walter N. Pahnke outlines nine interrelated categories of mystical experiences that were derived from a historical survey of the literature of spontaneous mysticism. These nine categories of unity, objectivity and reality, transcendence of space and time, alleged ineffability, a sense of sacredness, a deeply-felt positive mood, paradoxicality, transiency and positive changes

[17] *ibid.*, p. 128.

[18] Dr. Timothy Leary, a former psychology lecturer at Harvard University in the sixties became argubaly the greatest proponent of LSD and was adopted as a cultural icon of sixties counterculture.

in attitude and/or behaviour[19] are worth expanding on as they are representative of strategies that are present in the films of Belson and Whitney that I intend to focus on later in this chapter.

1. **Unity:** This is the defining characteristic of mystical experience. A sense of unity can be internal or external and can both occur within the same subject simultaneously during a mystical experience. Internal unity is reported to occur when all awareness of the individual senses ceases and the subject's sense of self dissipates into a pure consciousness. External unity, in contrast, entails an awareness of one or more particular sense impressions, for example touch or taste, that grow in intensity until the object of perception and the subject's sense of self cease to exist as individual entities and fuse to become one entity. This idea of internal and external unity is constantly reiterated throughout the work of both Belson and Whitney as they make continuous reference to the microcosms and macrocosms through their abstract images.
2. **Objectivity and reality:** The second category is composed of two interrelated elements. The first is a sense of illumination or knowledge relating to existence or being that is felt at an intuitive level. The second is a sense of certainty experienced by the subject that this knowledge is real and not a subjective delusion. This concept of objectivity is constantly being sought by both filmmakers through the process of assembling their images and through the subsequent viewing of the finished film. The viewer and filmmakers should theoretically feel a sense of enlightenment and a sense of certainty about life.
3. **Transcendence of space and time**: During the mystical experience the subject's orientation and sense of time can be so radically altered that they begin to feel as though they are residing outside of time and space. There is a definite sense of timelessness in all four of the films being examined in this chapter as though they are operating outside of normal clock time and a normal plane of consciousness.
4. **Alleged ineffability:** Psychologist and expert of world religions G. Ray Jordan writes of the problems that arise when discussing both mystical and drug induced psychedelic experiences due to a wide variance of experience between subjects and the inadequacies of language to describe this experience. In regards to his own LSD experience he describes it as "more of the same, only more so - by which I

[19] Walter. N. Pahnke, "Drugs and Mysticism" *The International Journal of Parapsychology*, Vol. 8, No. 2, Spring 1966, p. 295-313.

meant that it was much like my experiences before taking LSD except that there was an entirely new intensity or new dimension to everything."[20] There are certain problems finding the words to describe these films due to their abstract esoteric nature. By virtue of the structure and the images that are employed by Belson and Whitney they go beyond normal language to articulate their personal views of the mystical experience

5. **Sense of sacredness:** The subject may experience a sense of profound sacredness or holiness which leaves them overwhelmed by feelings of reverence and awe. Theoretically if the viewer responds in the manner intended by Belson and Whitney they will experience a sense of inviolability having attained a mystical experience.
6. **Deeply-felt positive mood:** Positive emotions of elation and joy are typically experienced while in the midst of an experience of mystical consciousness. This can vary from feelings of love and tenderness toward fellow man to intense *spiritual* orgasms. A deep sense of peace, understanding or tranquillity may also be experienced. I would contend that this category goes hand in hand with the previous one as presumably experiencing the sacred and profane combined with feelings of the Sublime by a process of experiencing the spiritually absolute visual music films would promote a positive mood.
7. **Paradoxicality:** Certain paradoxes that defy logic can occur while experiencing mystical consciousness. The subject can claim to have ceased to exist while they are clearly alive and in a state of existence when normal consciousness returns. This idea is represented by both filmmakers by their use of continuously circling shapes and particles accompanied by cyclical sound.
8. **Transiency:** The mystical experience undergone while under the influence of psychedelic drugs is transient lasting only a short period before the normal sense of consciousness is restored. This concept of transiency is inherent in the manner in which the films are presented to us, especially in the case of Belson, who as I have pointed out insisted that his films be screened in a cinema so that they were experienced from beginning to end. As the film ends so too does the altered state of consciousness.
9. **Positive changes in attitude and/or behaviour:** Subjects that experience mystical experiences tend to report positive changes in attitude and or behaviour towards

[20] G. Ray Jordan, "LSD and Mystical Experiences," *Journal of Bible and Religion*, Vol. 31, No. 2, April 1963, Oxford: Oxford University Press, p. 114-123.

themselves, towards others and towards the idea of mystical consciousness. There is no guarantee that the audience will be left with a positive change in attitude after viewing the films of Belson and Whitney but presumably there was a long-term affect on the mental state of both filmmakers through their achievement of a mystical state through yoga, meditation and filmmaking.

In addition to these nine categories of mystical experiences there are other acknowledged non-mystical forms of altered consciousness associated with the use perception altering drugs, for example, a distortion in spatial perception. For example an item placed across a room may suddenly appear to be close by. Another aspect of the aesthetic experience is the emergence of multi-coloured geometric patterns of abstract shapes and lines that appear in closed-eye vision only to remain superimposed on objects when the drug user's eyes are opened. These patterns are generally three dimensional in nature and constantly shift as though the subject is looking at the world through a kaleidoscope. Synaesthesia is typically experienced under the influence of such drugs, especially in response to music. Music can be seen or tasted or felt. These non-mystical elements will become evident in analysis of Whitney and Belson's films.

In a subsequent piece of work drawing on Pahnke's article "Drug and Mysticism" Pahnke and William A. Richards suggest that these aesthetic experiences of taking mind altering drugs do not constitute a mystical experience and in order for a mystical experience to arise one must undertake serious preparation in a "quiet reverent atmosphere."[21] Belson and Whitney engaged in yogic contemplation and transcendental meditation in addition to using psychedelic drugs in order to achieve higher states of consciousness. Furthermore, Belson managed to develop such a high level of meditative concentration that he managed to achieve mystical states of nirvana using only yoga and meditation. This is similar to Kant's proposal that it is only the virtuous, morally cultivated man who can experience pleasure, transcendence and therefore the Sublime.

[21] Walter N. Pahnke and William A. Richards, "Implications of LSD and Experimental Mysticism," .*Journal of Religion and Health*, Vol 5, No. 3, July 1966, Springer, p. 175-208.

THE ROLE OF INDIAN MUSIC IN SPIRITUALLY ABSOLUTE FILMS

Just as composers who wished to embody the spiritual in their music *turned East* for inspiration so too did visual music filmmakers like Jordan Belson and James Whitney, not merely for visual inspiration but also for musical inspiration. There was a move towards a more minimal aesthetic in music and visual art in the 1960s, which in turn inspired a sparser, more formal appearance in the aesthetic of the visual music films of Norman McLaren. In addition, the Eastern musical tradition had an influence on the work of minimalist composers such as Philip Glass, Lamonte Young, Steve Reich and Michael Nyman. With the exception of Lamonte Young, these composers, although they adopt particular characteristics of Eastern music, for example shunning harmony and using Eastern concepts of arranging rather than composing music, do not entirely commit to Eastern music.[1] They instead assume aspects of it but still reside within the confines of the Western classical condition. In the same way McLaren appropriated many of these characteristics for the structure of his three minimalist *Line* films while remaining within the confines of the formally absolute visual music film. Whitney and Belson, however, did not just incorporate elements of Indian music and its surrounding philosophy but embraced it visually as a whole.

To an ear so attuned to strictures of Western music it can initially seem difficult to come to terms with Eastern music and the weight of the "still surviving consciousness of the ancient world"[2] that it carries. The European scale has been reduced to twelve fixed notes by merging nearly identical intervals such as E flat and D sharp, which have come to occupy the same key on the piano keyboard. Sri-Lankan born philosopher Ananda Coomaraswamy, who was arguably one of the greatest promoters of the metaphysics of Eastern art and music in the twentieth century, posited that the piano is out of tune by "hypothesis," a compromise necessitated in the development of harmony that became intrinsic to the Western Classical music form.[3] In Indian music, by contrast, it is not the note that is fixed but a group of intervals with the vibrational value of a note depending on its position in a progression of notes rather than on its relation to a tonic note. The Indian scale of twenty-two notes relies on microtonal intervals of a quartertone between each note. Unlike in Western music, the intervals between these tones are rarely perceptible as it is not usual for musical themes in Indian music to employ even two consecutive notes in

[1] Lamonte Young became a renowned teacher of Indian music.

[2] Ananda Coomaraswamy, "Indian Music," *The Musical Quarterly*, Vol. 3, No. 2 (Apr., 1917), p. 63.

[3] *ibid*, p. 65.

succession and never three except as ornament. This use of unfamiliar intervals with many successive notes with small divisions is what makes the tonality of Indian music sound so strange to the Western ear. Indian music is purely melodic and eschews harmonised accompaniment other than a constant drone provided by instruments like the tamboura. In Western music, with exceptions of course, the notes and meaning of a musical theme is supplemented with notes of a chord.

Indian classical music, like Western classical music, has its basis in religion and spirituality. Renowned sitar player Ravi Shankar writes:

> [t]o us, music can be a spiritual discipline on the path to self-realisation, for we follow the traditional teaching that sound is God - Nada Brahma: By this process individual consciousness can be elevated to a realm of awareness where the revelation of the true meaning of the universe - its eternal and unchanging essence - can be joyfully experienced. Our ragas are the vehicles by which this essence can be perceived.[4]

According to Ancient Vedic scriptures there are two types of sound. The first is called *Anahata Nad* (the unstruck sound). This is what the ancient Pythagoreans referred to as the *music of the spheres*, the sound that the celestial bodies make as they move through the universe. Shankar notes that it is the "vibration of ether, the upper or purer air near the celestral realm."[5] It is this sound that is sought by the "great enlightened" yogis during their hours of meditation and contemplation. The second sound is referred to as *Ahata Nad* (struck sound). This type of sound encompasses any sound heard in general surroundings, whether musical or non-musical, man-made or natural.

Deleuze, Felix Guattari and Edgar Varese have all proposed that the synthesiser was built in the search for microtonality in a western context. The synthesiser, which Belson uses extensively in the assembly of his film soundtracks, was not unique in its search for microtonal intervals, the musical intervals that exist in between the standard twelve notes of the Western octave. Classical Indian instruments had been concerned with this matter for centuries. Jeremy Gilbert proposes that the sounds produced by instruments such as the sitar, tamboura and tabla "seem as close as can be to an instrumentation of pure sound as 'cosmic energy.'"[6] Eastern orientated soundtracks reinforce the cosmic films of both Whitney and Belson, augmenting the filmmaker's intention for the films to function as an aid to meditation through the stimulation of an additional sense. The sound prevents

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[4] Ravi Shankar, *op. cit*.
[5] *ibid.*
[6] Jeremy Gilbert, "Becoming Music: The Rhizomatic Moment of Improvisation," *Deleuze and Music*, Ian Buchanan and Marcel Swiboda (Eds.), 2004, Edinburgh: Edinburgh University Press, p. 130.

the viewer's mind from wandering through the distraction of external noises. Furthermore Deleuze compared the ability of "gaseous films" such as those by Whitney and Belson to "make intervals perceptible to the senses".[7] This is the visual equivalent of the microtonal intervals being sounded by the electronic synthesiser: in Belson and Whitney's films we are literally hearing and seeing *cosmic energy.*

In his essay "Aspects of Cosmological Symbolism in Hindustani Musical Form" Robert Sims writes that Indian music makes an "explicit recognition of the relationship existing between music and the spiritual dimension."[8] He also posits that almost all facets of Indian culture are founded on principles of the transcendent and unified by an "awareness of the cosmic hierarchy."[9] Finally, he proposes that if cosmology refers to the hierarchical order of reality that is both microcosmic and macrocosmic in nature, then music, which by its very nature is the ordering of sound is an "appropriate" and natural cosmological symbol.[10] These are the very reasons why Eastern music is a particularly apt model for the structuring of images in the spiritually absolute films of Belson and Whitney. It both binds together the cycles of images that constitute the films as a constant mantra as well as functioning as another spiritual element in the search for transcendence and the higher state of consciousness that Belson and Whitney are attempting to portray.

THE RAGA

Both Belson and Whitney foreground the *circle* in their films through their appropriation of circular images derived from cosmology such as clouds of nebulae, the circular form and movement of the images, the overarching circular form of the films and their use of cyclical musical forms such as the Indian *raga*. Like McLaren both filmmakers draw on the structure of Indian music. The form of the raga is fundamental to Indian music. Shankar writes:

> There is a saying in Sanskrit - "Ranjayathi iti Ragah" - which means, "that which colours the mind is a raga." For a raga to truly colour the mind of the listener, its effect must be created not only through the notes and the embellishments, but also by the presentation of the specific emotion or mood characteristic of each raga. Thus through rich melodies in our music, every human emotion, every subtle feeling in man and nature can be musically expressed and experienced.[11]

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[7] Powell, *op. cit*., p. 110.
[8] Sims, *op. cit*., p. 67.
[9] *ibid.*
[10] *ibid.*, p. 70.
[11] Ravi Shankar, *op. cit*.

It is difficult to define exactly what a raga is in Western terms. Even Ravi Shankar concedes that ragas are difficult to explain concisely.[12] A raga is modal in character but not in the way is which modes are used in the Middle or Far East. It is not a scale, melody or composition but is, as Shankar asserts:

> a scientific, precise, subtle and aesthetic melodic form with its own peculiar ascending and descending movement consisting of either a full seven note octave, or a series of six or five notes (or a combination of any of these) in a rising or falling structure called the Arohana and Avarohana. It is the subtle difference in the order of notes, an omission of a dissonant note, an emphasis on a particular note, the slide from one note to another, and the use of microtones together with other subtleties that demarcate one raga from the other.[13]

Indian classical musicians improvise on the melodic form of the raga. This central framework is undergirded by tradition and built on by the ability of musicians to improvise following years of dedicated study. Aesthetically, a raga is the "projection of the artist's inner spirit, a manifestation of his most profound sentiments and sensibilities brought forth through tones and melodies. The musician must breathe life into each raga as he unfolds and expands it."[14] As much as ninety percent of Indian music may be improvised and depends on the understanding of the musician on the nuances and subtleties of the raga on which he is extemporising. A parallel can be made between this idea of an Indian musician and Jordan Belson's manner of assembling a film. Belson dedicated himself to the study of Eastern religion, philosophy and practice before choosing a visual raga and improvising on it in real-time. Furthermore due to this improvisatory nature of Indian classical music, the artist is required to consider the time, place and mood for his recital as there should be a *spiritual quality* present in the musician's performance of a raga due to Indian music's religious origins. Perhaps this idea is one of the reasons why Belson was so particular about his films being screened in a controlled cinema environment. In many ways the *Vortex Concerts* were theoretically a better context for live improvisation than the controlled cinema screenings as Belson had the ability to improvise by *playing* his projectors as an Indian musician might play a sitar. The idea of *improvisation* in the traditional sense of the word is missing in a screening situation but Belson seems to have considered his improvisation to have taken place during the process of making the film.

All of the Indian performing arts are based on the idea of *Nava Rasa* (the nine sentiments). In relation to music, dance, drama and poetry the sentiments in traditional

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[12] *ibid.*
[13] *ibid.*
[14] *ibid.*

order are: Shringara (romantic and erotic): Hasya (humorous): Karuna (pathetic): Raudra (anger): Veera (heroic): Bhayanaka (fearful): Vibhatsa (disgustful): Adbhuta (amazement): Shanta (peaceful). Each raga is principally dominated by one of these nine rasas. Although there is room for the musician to introduce aspects of the other rasas into the raga, theoretically, the more closely the notes of a raga are wedded to the expression of one single rasa, the more overwhelming the effect of the raga. Each raga is associated not only with a specified mood but also with a particular time of day or time of year. Shankar writes the "cycle of day and night, as well as the cycle of the seasons, is analogous to the cycle of life itself."[15] There are seventy two "melas" or scales that can serve as the basis of a raga. These melas can be combined in many permutations. Although Belson and Whitney are attempting to imbue their films with moods I can find no evidence as to the exact *Rasa* that they use in each film.

A raga can be broadly defined as a series of musical notes which are systematically organised within a scale. Each raga has a certain set of notes which have to be adhered to. The ascending order of these musical notes is referred to as the *Aaroh* and the descending order is known as the *Avrohi*. Ragas can use flat or sharp notes and the number of notes within each scale can vary. In order for a raga to be recognised as a raga it must possess a *chalan*, a note pattern consisting of a principle important note called a *vadi* that recurs frequently throughout the composition and a second important note referred to as a *samavadi* that serves a support to the *vadi*. In the films of Whitney and Belson that I am focusing on in this chapter I would propose that images function as the visual equivalent of these principle and secondary notes. In the case of Whitney's film *Lapis* the mandala functions as the principle *vadi*.

Intrinsic to the raga are its rhythmic cycles or *talas*. Talas range from having a 3 beat cycle to having 108 beats within a cycle. The most frequently used are talas which have 5,6,7,8,10,12,14, and 16 beats to a cycle. The most important rhythmic determent is the rhythmic division and the *sum* (the stress on the first beat). It is this idea of a rhythmic cycle that is the most important to the structure of *Allures, Samadhi, Yantra* and *Lapis*. These films do not conform to a time signature in the Western classical tradition sense of the word. Neither do they conform to the 24 frame per second timing of the film sound projector. Instead they are arranged in rhythmic pulses rather than specific beats in a bar. The gaseous films of Whitney and Belson are sometimes not immediately thought of as visual music films and are sometimes referred to as "cine-poems" but this may be due in

[15] *ibid.*

part to a Western eye unaccustomed to Eastern musical structures. Coomaraswamy wrote that a listener must:

> co-operate with the musician by the surrender of the will and by drawing in his restless thought to a single point of concentration: this is not the time or place for curiosity or admiration. Our attitude towards an unknown art should be far from the sentimental or romantic, for it can bring to us nothing that we have not already with us in our own hearts…[16]

Likewise the viewer of a James Whitney or Jordan Belson film must relinquish their minds to the images and sound and be drawn into the world of the filmmakers in order to experience the something that lies just beyond the grasp of language.

THE CLOSED EYE CINEMA OF JAMES WHITNEY

While Belson was still focusing his creative energy predominantly on the Vortex Concerts, his friend James Whitney had begone to explore more spiritual concerns in his visual music films. Heavily influenced by the formal absolute films by Richter, Eggeling, Ruttmann and Oskar Fischinger, Whitney began to collaborate with his brother John on a series of short films entitled *Five Film Exercises* (1943-45). Composed of simple abstract shapes, these exercises were primarily a formal exploration of the audio-visual relationship. While John continued to consistently pursue a formal agenda based on theories of harmony in his visual music, James began to make films that were influenced by his interests in mysticism, Jungian psychology, alchemy, yoga, Tao, quantum physics, Krishnamurti, Ramana Maharshi and consciousness expansion. William C. Wees, in his book *Light Moving in Time: Studies in the Visual Aesthetics of Avant-Garde Film*, refers to these films as "films for the inner eye."[17] Whitney derives his imagery in these films from the dots of light that we can perceive when our eyes are closed and the abstract geometric forms of hallucinations.

YANTRA (1957)

Whitney like the majority of visual music filmmakers that I discuss, began his career as a painter. His grounding in fine art is especially evident in *Yantra*. Made by painting through pinholes punched into grid patterns in 5" by 7" cards *Yantra* employs many of the shapes, rhythms and formal structures that have been made familiar through

[16] Coomaraswamy, *op. cit*., p. 165.
[17] Wees, *op. cit.*, p. 136.

modern abstract art. In addition, all of the action occurs on the flat plane, but unlike *Rhythmus 21* the plane does not function like a substitute canvas. Instead, it seems more like a window that an interstellar traveller is gazing out of as they hurtle through nebulous galaxies of shooting stars, collapsing supernovae and diffusing nebulae.

There is a marked problem when one tries to articulate the ineffable. Whitney clearly understood the limitations of existing language to express the inexpressible and asserts that he seeks to "go beyond any language"[18] in what Gene Youngblood refers to as an "attempt to approximate mind forms."[19] Wees explains that a yantra was traditionally used in Eastern mysticism as a "machine to stimulate inner visualisations, meditations, and experience."[20] James Whitney designed his films as aids to meditation and used rhythmical abstraction in an attempt to induce a trance-like state in the observer. Essentially, the dot patterns on the screen in *Yantra a*re functioning as an instrument to focus psychic forces by concentrating them on a pattern. By directing the viewer's eye toward this pattern at the centre of the screen he is holding both the viewer's *outer* and *inner* eye captive, hypnotising them to carry them on their cosmic journey.

The opening identification for the Whitney's production company "Uroboros" prepares the viewer for the material that they are about to encounter. The word "Uroboros" is accompanied by the symbol for the uroboros. This theosophical symbol of a snake biting its tail is an emblem of wholeness, totality and infinity and signifies the constant recycling or renewing of the universe. It manages to encapsulate the core tenets of Whitney's philosophical beliefs in one single image.

The imagery of the film is difficult to describe as it is in constant flux. *Yantra* was intended to be a silent film. The electronic soundtrack was added later added during a screening of the film at the *Vortex Concerts*. In spite of this electronic soundtrack, which does not seem to have an overt Eastern influence, *Yantra* would appear to draw its structure from Classical Indian music, albeit loosely. As found in an Indian raga, there is continuous repetition of a cycle that opens with a flickering between coloured backgrounds, over which rings of loose white dots zoom into view until the image dissipates in the distance. When writing about his use of the flicker in his flicker films such as *Ray Gun Virus* (1966), Paul Sharits wrote "[i]n my cinema flashes of projected light initiate neural transmission as much as they are analogues of such transmission

[18] James Whitney cited in Wees, *op. cit*., p. 112.
[19] Youngblood. *op. cit*., p. 222.
[20] Wees, *op. cit.*, p. 13.

systems"[21] and "light-colour-energy patterns generate internal time-shape and allow the viewer to become aware of the electrical-chemical functioning of his own nervous system."[22] Visually and aurally Sharits' and Whitney's films are very different but the flicker is serving the same function. In some ways the pulse of the flicker is functioning like the drone that underscores an Indian musical composition. The flicker in *Yantra* is establishing a pulse to draw the audience into the rhythm of the film and working like a drone over which the melody of dot images is played.

Yantra, is, as I have mentioned above, arranged in a series of cycles in the same way that a traditional Indian raga is. As the film progresses the initial cycle of dot formations is repeated in subsequent cycles with subtle variations just like a sitar player improvising around the central theme of a raga until it reaches the final cycle.

The figure of the dot is functioning as the *vadi* or principle note in the film. The dot is the basic compositional form for all images in the film and recurs throughout. These clusters of dots continue to materialise and dance around the screen surface like sub-atomic particles racing around the nucleus of an atom. Whitney's dots, due to the simplicity of their structure, have an ambiguity to them and it is this ambiguity that allows Whitney to make connections at microcosmic and macrocosmic levels (see figure 3.1 and figure 3.2). This idea harks back to the Neo-Platonic idea of microcosm and macrocosm in which identical patterns can be identified at all levels of the cosmos but is also found in Eastern religions such as Taoism. Whitney's dots can embody the most minute atomic particles and cells while simultaneously exemplifying all of the celestial bodies in the universe. Whitney establishes a pattern of dot images that are repeated at the beginning of each cycle and added to as each cycle progresses. This serves to emphasise the idea of the

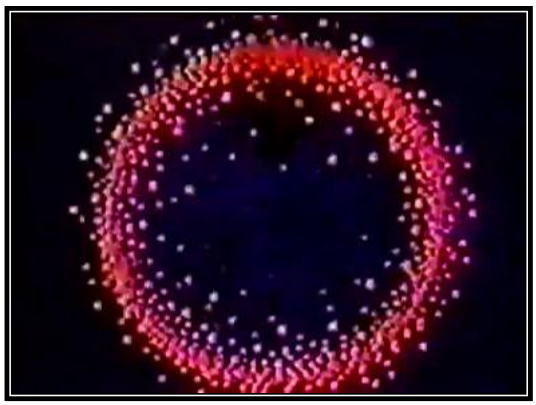

FIGURE 3.1: STILL FROM JAMES WHITNEY, *YANTRA* (1957), HTTP://YOUTU.BE/NVWWLZSXAR0.

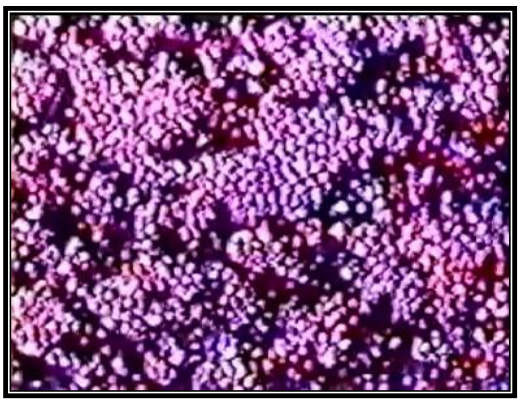

FIGURE 3.2: JAMES WHITNEY, *YANTRA* (1957), *OP. CIT.*

[21] Paul Sharits cited in Wees, *op. cit*., p. 147.
[22] *ibid.*

interconnection of both realms of the cosmos. In the initial cycle these dots form clusters which burst apart like supernovae exploding in space. They appear and disappear while particles swirl and dance like Catherine wheels or shooting stars. The second distinct dot pattern in a cycle consists of small nebulous clouds gathering behind dot formations before the screen fills with bacilli shaped forms that multiply like bacteria to fill the entire screen. They diminish in size and multiply, continuing their steady dance before reducing in number and moving like asteroids through space.

The second cycle sees the addition of dividing clusters of dots to the cycle (see figure 3.3). The dot particles split horizontally across the screen. This image could be said to be a manifestation of Whitney's fascination with quantum mechanics, which posits that an atom or a subatomic particle can exist simultaneously in more than one place due to their energy being in a constant state of flux. This atomic splitting gives rise to stylised dot patterns arranged in ring formations undulate over fluctuating hazy backgrounds. They look like graphic representations of the rays of the sun or atomic radiation being released after nuclear fission.

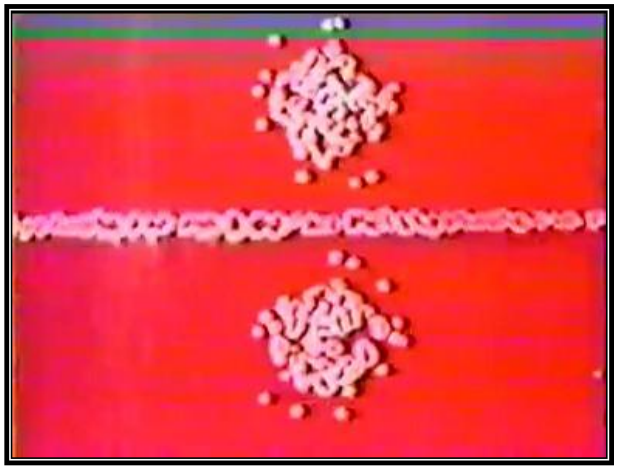

FIGURE 3.3: STILL FROM JAMES WHITNEY, *YANTRA* (1957), *OP. CIT.* DEMONSTRATING DIVIDING DOT CLUSTERS.

In contrast to the constant cycling of dot forms in *Yantra* there is one geometrical image of a circle inscribed in a square that appears in (what I deem to be) the third cycle. This image visually seems incongruous when juxtaposed with the fluidity of the preceding imagery. Symbolically, however, it represents the union between the heavenly and infinite and the earthly and man-made. It is a figure that occurs in both Christian and Eastern religions and Whitney is using to hammer home his central message, the interconnection of everything on a micro and macrocosmic level.

As I have previously mentioned *Yantra* has an electronic soundtrack that was added to it after completion. The music opens with a simple shrill electronic melody being

played on a keyboard that is continually repeated throughout the first cycle as the volume increases. It is joined by a low drone towards the end of the cycle. The drone and repeating variations on the electronic keyboard motif return for the second cycle. A harsh *omm* sound, like a yogic mantra being repeated, characterises the third cycle. The melody has gone to be replaced by long discordant metallic sounds. These metallic sounds gather in speed as the symbol of the circle enclosed in a square is consumed by particles. From now on the sound is marked by sequences of *Shepard's scales.* While working for Bell Telephone Laboratories during the 1960s, cognitive scientist Roger N. Shepard discovered a sequence of sound that has come to be known as the *Shepard's Scale* or *Shepard's tone*. This sequence is comprised of a set of computer-generated tones that have been shown to lead to a breakdown of perception in the way in which a listener will judge relative pitch. Shepard explains it thus:

> A special set of computer-generated complex tones is shown to lead to a complete breakdown of transitivity in judgements of relative pitch. Indeed, the tones can be represented as equally spaced points around a circle in such a way that the clockwise neighbour of each tone is judged higher in pitch while the counter clockwise neighbour of each tone is judged lower in pitch. Diametrically opposed tones – though clearly different in pitch – are quite ambiguous as to the direction of the difference.[23]

In other words it gives the illusion that the music is perpetually ascending or descending in pitch but without the pitch ever actually getting higher or lower. One of the most prominent uses of *Shepard's Scale* is in György Ligeti's "Etude no. 13 For Piano (L'escalier du Diable)." The Kafkaesque concept, as evidenced from the sub-title, is the experience of trying to escape from hell on the *devil's staircase* without ever actually making any progress. This idea could be extended to Whitney's film as firstly he is reinforcing the idea of a circular interconnection between the microcosm and macrocosm and secondly there is the impression that although Whitney and the viewer are striving to reach an expanded state of consciousness through the film they are still shackled to their earthly existence and will never truly attain total transcendence. There could conceivably be another reading of this as at the end of one sequence of *Shepard's Scales* towards the end of the third cycle, clusters of particles explode on screen and it could be interpreted as Whitney and the viewer having broken through the psychological barrier to achieve this state of transcendence.

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[23] Roger N. Shepard, "Circularity in Judgements of Relative Pitch," *The Journal of the Acoustical Society of America*, Vol. 36, No. 12, p. 2346.

This scale returns in many variations, becoming more and more unstable and superimposed on itself as the imagery on screen becomes more unstable towards the end of the film. Often these variations are accompanied by hard metallic sounds like electronically treated gamelan drums or stylised bell sounds. The images are not synchronised to the music, rather they share a common pulse. Although the music shares many common themes as demonstrated by the use of *Shepard's Scale*, there seems to be no synaesthetic or real rhythmical correspondence with each track seeming to enjoy an independent existence.

The integration of the images and music is therefore not wholly successful in the case of *Yantra* and serves to detract from Whitney's central ambitions to portray the interconnectedness of the micro and macrocosms, to show the completeness and constant renewal of the universe and to use the film as both an aid to and representation of the altered state of consciousness achieved through the process of meditation. There are successful image-sound translations such the use of the electronic drone as a constant centring base for concentration and the use of the *Shepard's Scale* as an aural metaphor for increased neural activity during meditation and the circular relationship between all aspects of the cosmos, but on the whole the soundtrack is too forceful in its execution. The entire effect can be overwhelming and unsettling and at times the electronic drones can sound like stylised screams rather than reciting a mantra. Whitney's films would, on the whole, have been better served with a fully Eastern soundtrack that reinforced the connection between music, image and spirituality and eased the mind of the viewer into a meditative state. Alternatively the film could have functioned silently due to the power of the repeated images and cyclical structure.

LAPIS (1966)

Physically and mentally exhausted from the five years that he spent making *Yantra* Whitney turned to an analogue computer system developed by his brother John for his 1966 film *Lapis*. The title makes reference to the "philosopher's stone," which is an alchemical symbol for eternal life and an aid to mediation. The main imagery in *Lapis* is derived from the symbol of the mandala (see figure 3.4). David Snellgrove states that a mandala is a circle composed of symbolic forms consisting of "one symbol at the centre, which represents absolute truth itself, and other symbols arranged at the various points of

the compass, which represent manifested aspects of this same truth."[24] Grace E. Cairns claims that the mandala functions as a:

> potent psychological aid in the reintegration process of the aspirant who, in concentrated meditation upon this symbolic device, grasps vividly the unity of the cosmos in all its hierarchic levels of truth and reality; then, in the concentration process of the internal microcosmic *mandala*, he perceives himself as identical with the eternal macrocosmic *mandala*…. The things that were perceived before the experience as separate entities, each in its own time and space location, are now seen as organic parts of one unified Being…[25]

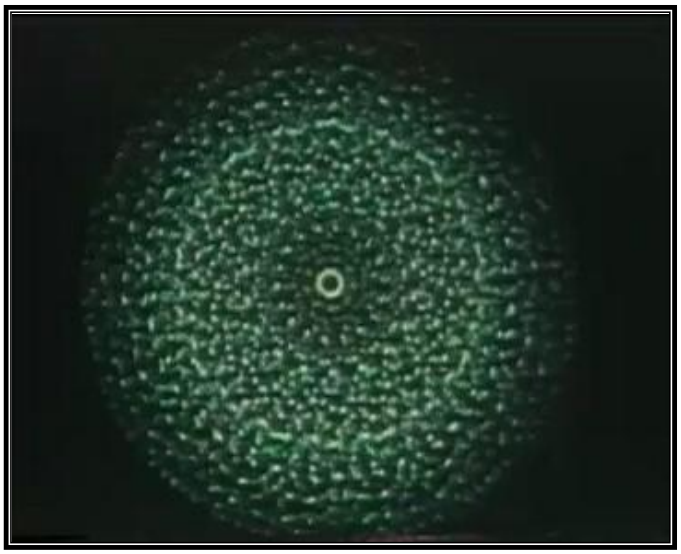

FIGURE 3.4: IMAGE FROM JAMES WHITNEY, *LAPIS* (1966), HTTP://YOUTU.BE/KZNIAKXMR2 DEMONSTRATING AN IMAGE OF A MANDALA.

To paraphrase Cairns, the mandala is functioning like a yantra. It is serving as a device to focus the energies of the mind for meditation. There are many complex explanations concerning the difference between the yantra and the mandala. Gudrun Bühnemann summarises the main arguments in the book *Mandalas and Yantras in the Hindu Traditions*.[26] She concludes that although many theorists consider the terms to be synonymous the general consensus is that a yantra represents "the microcosm and accommodates a pantheon of deities who are positioned on it according to rank."[27] A yantra, in contrast, represents a single deity, who may be accompanied by an entourage.[28] Perhaps, using this distinction, *Lapis* can be viewed as a development from *Yantr*a. Rather than focusing on the microcosm of a single deity or focusing the inner eye of a single

[24] David Snellgrove, "The Tantras," in *Buddist Texts Through the Ages*, I. B. Horner, D. Snellgrove, and A. Waley (Eds.), 1954, New York: Philosophical Library, p. 246.

[25] Grace E. Cairns, "The Philosophy and Psychology of the Oriental Mandala," *Philosophy East and West*, Vol. 11, No. 4, January 1962, University of Hawaii Press, p. 222.

[26] Gudrun Bühnemann et al, *Mandalas and Yantras in the Hindu Traditions*, 2003, Amsterdam: Brill.

[27] *ibid.*, p. 17.

[28] *ibid.*

viewer in *Yantra*, Whitney is focusing on the macrocosm of multiple deities in *Lapis* attempting to connect the viewer with the universe in its entirety. The imagery is certainly richer and more complex in *Lapis* than in *Yantra.*

Like *Yantra, Lapis* is arranged in a series of cycles and also opens with the symbol of the Uroboros, again to reinforce the interconnectedness of everything, before cutting to a white screen. This first cycle or prelude is functioning as an *alap,* the slow introductory section of a raga. Unmetered, improvised and accompanied only by a drone, it begins with a slow tempo and introduces elements from the main raga. As a mystical strum sounding on a sitar signals the beginning of the film, an image of a ring composed of many black undulating dots slowly comes into view as the film. It seems as though the camera is zooming out, crushing the perspective or more aptly as though the viewer is an astronaut moving through a star field. The dots grow more numerous and the screen flickers before flashing back to a white screen overlaid with an intricate mandala composed of black dots swirling an anti-clockwise direction in synchronisation with the music. It is almost like looking into a black hole or the eye of the universe.

This cycle is also marked by the introduction of a complex mandala changing colour to red and orange forming wider, bigger mandalas that are reminiscent of the sun. The dots swirl to fill the screen as though they are spiralling into the centre like a kaleidoscope of constantly shifting shapes and colours. The mandala breaks apart and the dots reform to create the word *Lapis* on a white background. The letters look like the figures formed from dot patterns in an Ishihara Test for colour blindness. The sound of the drum bursts in and sets a steady percussive rhythm that the subsequent mandala images synchronise with.

Throughout the film there are a series of complex mandalas reminiscent of Islamic mosaics. In these mandalas the viewer can no longer discern the individual dots, instead perceiving a single throbbing ring of rhythmically pulsating energy. The mandalas rotate in an anti-clockwise direction with the focus moving into the centre to reveal images that are reminiscent of genetic material such as chromosomes before moving out again to reveal a complete mandala once more. The hue of the mandalas in *Lapis* varies throughout and can be yellow, green and black. They often come to resemble swirling galaxies, while at the same time resembling the knotted eye of a lizard, thus reinforcing Whitney's ambition to form a connection between the inner and outer eye through the ambiguity and saliency of his images.

As the cycles progress there is a move away from complex mandalas to new

circular images that are less overwhelming in their complexity. Whitney uses glowing images of overlapping concentric circles that fluidly open out like the petals of a stylised flower opening in the sunlight and close like flowers closing at nighttime. The phosphorescence of the images in *Lapis* is replaced in the fifth cycle by a pastel solarised tone. These pastel images retain much of the complex structure of the original mandalas and come to take on the appearance of a human eye with a black pupil, a blue iris and a white sclera. Again Whitney is making a connection between the inner and outer eye with this image.

The film ends with a stark white mandala on a black background. This mandala is like a negative image or a photogram of the other mandalas. The mandala elongates and shudders as it tries to split into two, like cells dividing in order to replicate or atoms splitting during nuclear fission. The white shape finally manages to split in two, forming two new identical shapes that dissolve into a black mandala on a white background. This sequence is at odds with the vibrating pulse of the rest of the film. The split is violent and forceful and breaks the constant visual drone. The musical accompaniment however does not break its rhythm and manages to maintain a synchronisation with the images despite achieving an inordinate speed and force.

An Eastern orientated soundtrack reinforces Lapis. *Lapis*, like *Yantra*, was conceived as silent. The classical Indian Raga plucked on the strings of a sitar that seems to so perfectly complement the cosmic imagery of *Lapis* was also a later addition at the behest of the film's distributor Bob Pike following a vogue for Indian music at the time. The profile of Indian Classical music rose in the wake of sitarist Ravi Shankar's influence on both classical music and pop music. Following on from his 1956 tour of Europe and the United States Shankar began to make recordings of his music that the American group The Byrds incorporated aspects of into their pop songs. It was however, when Beatle George Harrison began to study the sitar under Shankar in 1965 that this style of music really entered public consciousness. A successful 1966 collaboration with violin virtuoso Yehudi Menuhin entitled "East Meets West" compounded the acceptance of Indian Classical music as a fashionable entity in sixties culture.

William Moritz contends that the "perception of the visual meaning of the film can be enhanced without the music."[29] Although the film was designed to be screened as a silent piece in the same way as *Rhythmus 21* and *Symphonie Diagonale*, in this

[29] William Moritz, "William Moritz on James Whitney's *Yantra* and *Lapis*," 1977, http://www.centerforvisualmusic.org/WMyantra.htm, [Accessed: October 3rd 2009].

circumstance the case can be made that the addition of a musical soundtrack augments the filmmaker's intention for the films to function as an aid to meditation through the stimulation of an additional sense. Michael R. Stevens writes "all Indian music stems from, and to some extent imitates, the human voice."[30] In *Lapis* the low pitch of the strings sounds like the "omm" sound of a mantra being repeated by a human voice and serves to further centre the mind. Furthermore Powell writes that Deleuze compared the ability of "gaseous films" such as those by Whitney and Belson to "make intervals perceptible to the senses."[31] This is the visual equivalent of the microtonal intervals being sounded by the electronic synthesiser in *Yantra* and the traditional Indian instruments in *Lapis.*

THE TRANSCENDENTAL CINEMA OF JORDAN BELSON

As I have already pointed out Belson's films present themselves as objects of meditation by presenting the viewer with visual, aural, and rhythmic equivalents of expanded states of consciousness. Belson's early films, which are no longer in existence, were single-cell animations that were influenced by formal visual music films that he had seen by Fischinger, McLaren and the Whitney Brothers at the initial Art in Cinema screenings in 1947. They were essentially a continuation from the graphic scroll paintings that he had been focusing on prior to this. Following his collaboration with Henry Jacobs at the Vortex concerts he completely revolutionised the way in which he worked and switched to real-time photography, incorporating many of the resources and images garnered from his time at the Planetarium. James speculates that this "allowed him to develop many of his rhetorical motifs, as well as supplying a model of the synaesthetic interchange between sound and vision."[32] *Allures* is the culmination of this phase of transition and serves to mediate between his initial graphic films and his second gaseous phase.

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[30] Michael R. Stevens, "The Training of Indian Musicians," in *Music Educators Journal,* Vol. 61, No. 8, April 1975, MENC: The National Association for Music Education, p. 37.

[31] Powell, *op. cit*., p. 110.

[32] David. E. James, *op. cit*., p. 128.

ALLURES (1961)

One can observe that the images in *Allures* are in fact archetypal images. The images in *Allures* are classic representations of images experienced during the use of consciousness expansion drugs such as peyote and LSD. Belson himself contends that the film "relates more to human physical perceptions"[33] than any of his other films but also cedes that there is actually "nothing really personal in the images."[34] In his book *Light Moving in Time* William C. Wees remarks that *Allures* may almost be a "textbook illustration"[35] of many elements that psychologist Ronald K. Siegel described in his study of hallucinations in 1926. It also exhibits many of the mystical and non-mystical categories that Pankhe lays out in his study of mystic and perception altering drugs. Youngblood refers to *Allures* as a "mathematically precise film on the theme of comogenesis"[36] (the birth of the cosmos). In many ways it is like watching a universe being born and evolving as the film progresses. Many of the dot patterns foreshadow the dots of light that John Glenn, the first astronaut to orbit the earth, would observe during his initial Project Mercury mission (on subsequent study by NASA these dots of light turned out to be ice-particles in the earth's atmosphere). Belson himself designed the special effects for Philip Kauffmann's 1983 adaptation of the Tom Wolfe novel *The Right Stuff* detailing America's role in the space race during the fifties and sixties.

Further to this astronaut Edgar Mitchell, a member of the Apollo 14 lunar mission, when discussing his journey home from the moon, speaks of a feeling of *oneness* between him and the universe that promoted feelings of ecstasy within him:

> The biggest joy was on the way home. In my cockpit window every two minutes, the Earth, the Moon, the Sun, and a whole 360 degree panorama of the heavens. And that was a powerful, overwhelming experience. And suddenly I realised that the molecules of my body and the molecules of the spacecraft and the molecules in the body of my partners were prototyped and manufactured in some ancient generation of stars. And that was an overwhelming sense of oneness, of connectedness. It wasn't, "Them and us." It was, "That's me." "That's all of it. It's one thing." And it was accompanied by an ecstasy. A sense of, "Oh, my God, wow, yes!" An insight. An epiphany.[37]

It is these sublime feelings inspired by the cosmos that Belson and Whitney are attempting to embody in their films.

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[33] Belson cited in Youngblood, *op. cit.*, p. 162.
[34] *ibid.*,
[35] Wees, *op. cit.*, p. 131.
[36] Youngblood, *op. cit*., p. 160.
[37] Edgar Mitchell, Interview, *In the Shadow of the Moon*. Dave Sington (Dir.), 2008, Channel 4 DVD.

Allures shares much of the same imagery and ambitions of both *Yantra* and *Lapis*. It also shares the same compositional structure. As the structure and ordering of the images in *Allures* is fundamental to Belson's world view it is worth briefly going through it cycle by cycle. Composed of distinct cycles that roughly serve the same function as movements in the western classical tradition of music, *Allures* opens with delicate electronic notes sounding as a wavering phosphorescent pink graphic *Allures* appears on screen. These sustained tinkling bell sounds function as a signal to mark the beginning of the film and also as an indicator for the viewer to prepare for their mystical journey. These bells have a distinct even rhythm to them in spite of their sustained sound. The words look as though they are lapping in water and dispersing with each ripple of the surface as the sound of the electronic bells decay. The screen turns black and sustained layered electronic notes sound over it.

In the first cycle of *Allures* the viewer travels through a vortex of concentric circles, asteroid fields of misshapen dots radiating out from black centres changing colour from pink to orange to green. It is like looking into a tunnel, filling the screen and perpetually directing the viewer's attention towards the centre of the screen and gently relaxing their minds in order to guide them through the first layers of consciousness. The music consists of a sustained electronic melody layered over a persistent low rumbling drone. The musical accompaniment serves to reinforce this rotating swirling vortex movement as it sounds as it seems to swirl around the speakers growing louder as the intensity of the swirling images increases. This could be said to reflect the increasing force of the neural activity that is building in the brain as it enters into a meditative state.

The opening image of the film establishes the outwards radiating movement of the majority of the images and forms the *chalan* or characteristic note pattern of the composition that will recur throughout the film with variations. The ringed dot formations burst outwards and dissipate into the ether of the black screen. This circular dot image of the *dot burst* is like *vadi* or principle note, persisting throughout the film. The next image that occurs is that of the diamond shapes swirling around a central circular point on the screen. The constant anti-clockwise movement of the diamond forms focuses the attention of the viewer towards the middle of the screen. The sound begins to fade out as the cycle draws to a close.

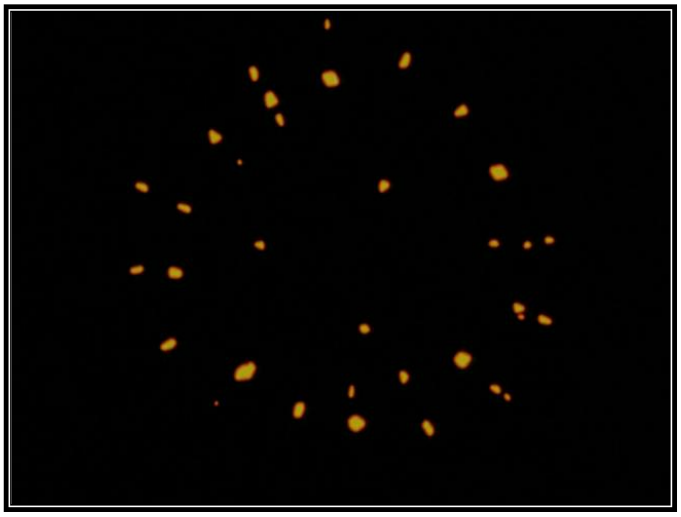

FIGURE 3.5: JORDAN BELSON, *ALLURES* (1961), JORDAN BELSON: FIVE ESSENTIAL FILMS [DVD], 2007, L.A: C.V.M. DEMONSTRATING AN EXAMPLE OF A CIRCULAR DOT PATTERN FROM THE FIRST CYCLE OF THE FILM.

A black visual silence marks the end of one cycle and the beginning of the next. The music continues over the black screen smoothing the transitions and maintaining an even continuity. This movement introduces the image of the mandala that occurs with variations throughout the film. This mandala could be designated as the *samavadi* or supporting note as it also recurs in various permutations throughout the film. The opening mandala of the second cycle gives way to a formal representation of a conch shell. The conch shell fades in while simultaneously spinning in the opposite direction, anti-clockwise as though fighting against clock time. It grows larger as it spins and fades out to a black screen. The music also fades marking the definite end of the cycle.

Electronic renderings of the voices of jungle animals herald the beginning of this new cycle. Visually the third cycle continues in the same vein as parts one and two. The geometric graphic images with clearly demarcated edges continue to spin in the centre of the screen in order to focus the attention of the audience. The image of the mandala recurs in this part but Belson, for the most part, continues to introduce new material. A tinkling piano sounds out an elegiac romantic theme in a 4/4 rhythm before the piano notes subsequently become low dramatic sustained rumbles. The action of the images in this cycle corresponds closely to the timing of the music with the action pausing in synchronisation of sustained piano chords.

The image of a spinning windmill serves the same meditative focal point as the whirling mandalas, conch shell and diamond vortex. Belson introduces the image of curves twirling in an ellipse. The use of the ellipse rather than a strict circle gives the impression that the viewer is gazing down at a black hole swallowing the coloured gas of

dying stars into the centre of its vacuum. Here Belson is beginning to make a connection with cosmological imagery. This cycle also sees Belson becomes more explicit in his use of the circle as an expression of the universal and infinite. He introduces the vector image of the stark white ring on a solid contrasting black background. There are definite cuts between images in this cycle as they tend to *appear* unannounced, synchronised to the lugubrious distinct piano notes.

Cycle four begins a tiny flickering sun that is serving the same function as the flicker in the films of Paul Sharits and John Whitney. The image of the flickering sun gives way to a round hazy ring that is reminiscent of a doughnut. The sustained music begins to waver in time with the pulsating hazy rings.

The fifth cycle of the film shows a marked progression in the type of images and movement used. Rather than a single image rotating in a clockwise direction on a flat background Belson introduces thick brush strokes that reference the thick tinted anthropomorphic strokes in Ruttmann's film *Lichtspiel Opus II* (see figure 3.6). Belson almost certainly was aware of the work of Ruttmann and Oskar Fischinger, who influenced by Ruttmann, also employed the image of the brush stroke in his visual music films. These thick boldly coloured brush strokes snake there way horizontally and vertically across the screen. They bend and cavort around the screen like horses leaping over jumps. It is as though the figures are possessed of a life or their own, engaged in a frantic bacchanal that synchronised to the rhythm of the piano melody.

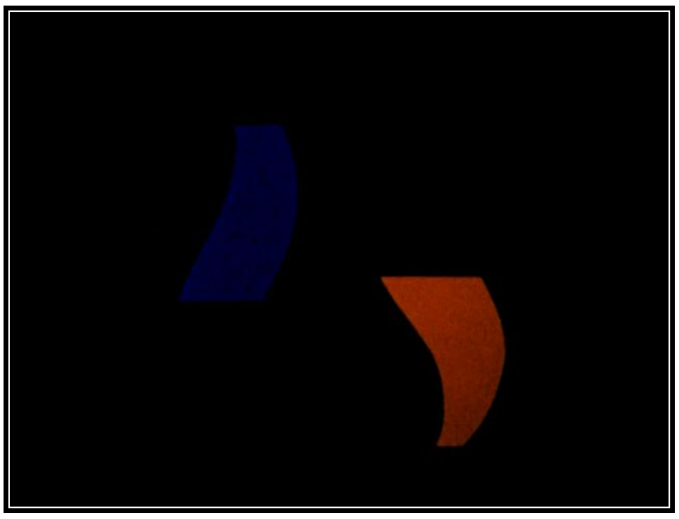

FIGURE 3.6: IMAGE FROM THE FIFTH CYCLE OF BELSON, *ALLURES* (1961), *OP. CIT.* REFERENCING THE IMAGERY FROM *LICHTPSIEL OPUS I.*

The next major set of images look like stylised star fields composed of various graphic combinations (see figure 3.7). The separate elements fluctuate and move constantly. Each field has its own unique corresponding sound. The v-shaped figures are

accompanied by sounds like fireworks exploding and later, when they appear in varying colours, in conjunction with a sound like that of a deck of cards being shuffled. High-pitched electronic sounds escort streaks allied in pairs across the screen. Yellow dots appear and move to a soft fast percussive sound, while the fields of pink dots streak in rhythm with a *plinking* sound like the hard metal mechanism of a music box being plucked by a finger. These fields bring to mind electronic circuits firing especially in the wake of the flickering that demarcates the end of the cycle. It is not a stretch to suggest that Belson is using these images as a metaphor for what happens to the neural synapses during the process of deep meditation.

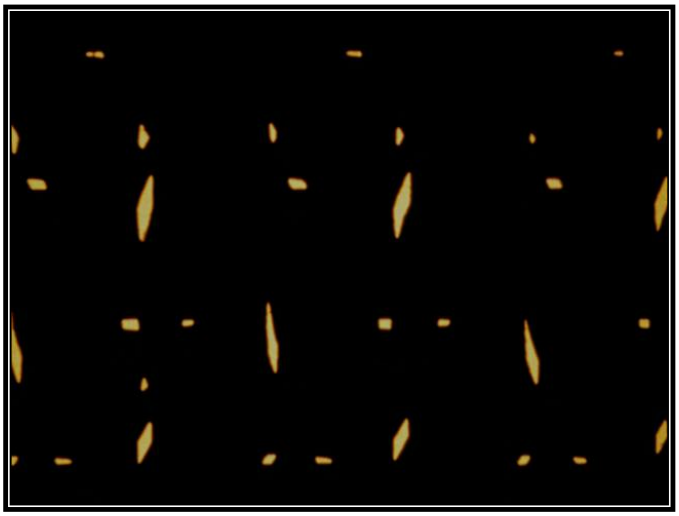

FIGURE 3.7: IMAGE FROM THE FIFTH CYCLE OF BELSON, *ALLURES* (1961), *OP. CIT*.

One would be forgiven if they imagined that a new film had suddenly replaced the film that they had been watching. The images that mark the beginning of cycle six appear to be completely at odds with the images that have thus far been encountered in *Allures*. A flickering at the end of previous cycle and the beginning of this cycle provides a seamless segue between cycles.

The first section of Cycle six consists of flat boldly coloured circles nestled on flat boldly coloured backgrounds. Despite the intensity of the colours they are in fact in constant flux, fading between different hues. The circle and the square of the background fade at different rhythm, one after the other as though involved in a call and response song. The solidity of the images becomes hazier and more gaseous as the cycle progresses, taking on the appearance of a dying sun in a desert sky (see figure 3.8). The same pattern of fading remains however. The low sustained rumble of the music that sounds not unlike a foghorn begins to sound like a tape-recorder rewinding. It grows higher and higher in pitch as the screen flickers wildly with the violent death of the sun.

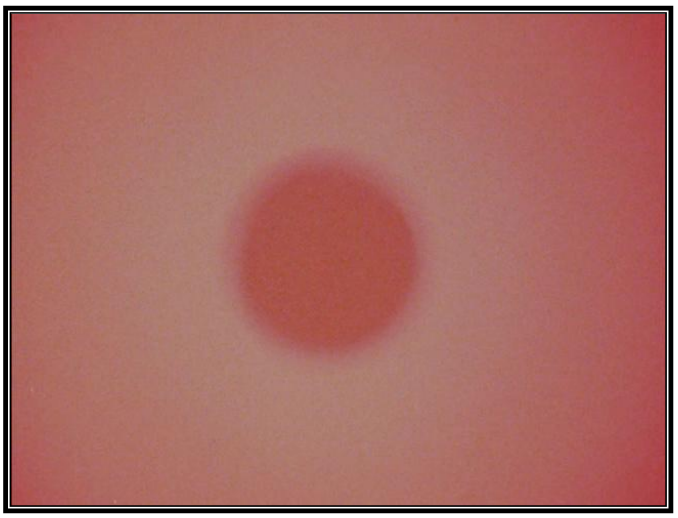

FIGURE 3.8: IMAGE FROM CYCLE SIX OF BELSON, *ALLURES* (1961), *OP. CIT*.

The ringing of an electronic bell announces the beginning of the next cycle. The images are a major contrast to the flat images of the sixth cycle. The images are more delicate in detail and appear to be referencing science and the cosmos through their compositional structure and the Brownian nature of their movement. The imagery of this cycle changes dramatically conceding to a celestial spiral formed from tiny dots and radiating yellow phosphorescent light from its centre as it spins hypnotically. It looks like a spiralling galaxy with a magnetic centre attracting and repelling iron shavings. The viewer is drawn into the centre of the spiral as it expands outwards as though they are an interstellar traveller passing through a star field. As the viewer enters this star field there is a repeated electronic sound like an engine revving repeatedly.

FIGURE 3.9: IMAGE FROM CYCLE SEVEN OF BELSON, *ALLURES* (1961), *OP. CIT*.

This cycle is also marked by representations of three dimensional orbits of atomic particles around a central nucleus and straight lines circling the screen in loose orbits (see figure 3.10). This is accompanied by ethereal electronic sounds like a metal tube being swung and is not unlike the orchestral work of Ligeti. It is reminiscent of "Atmospheres," his 1961 musical composition that Stanley Kubrick used to accompany the star gate sequence towards the end of *2001: A Space Odyssey* (1968). The final new image in Cycle seven is rooted in the dotted star fields that were first occurred in the fifth cycle. These fields of fields of dots and dashes superimposed over each other reflect the speed and activity of the neural pathways as they enter even deeper into the state of meditation. The pulsing high-pitched electronic sound with its accompanying lower pitched *beating* sound makes a stylised connection with the nervous and circulatory system. If one was to enter an anechoic chamber, which contains a vacuum through which sound cannot travel, the only sounds that would be heard would the low pitch of the circulatory system and the higher pitch of the nervous system. These sounds of our biological processes are always present but under normal circumstances our minds filter them out. Presumably under the intense concentration of meditation or the influence of perception altering drugs these sounds could be perceived aurally and/or visually.

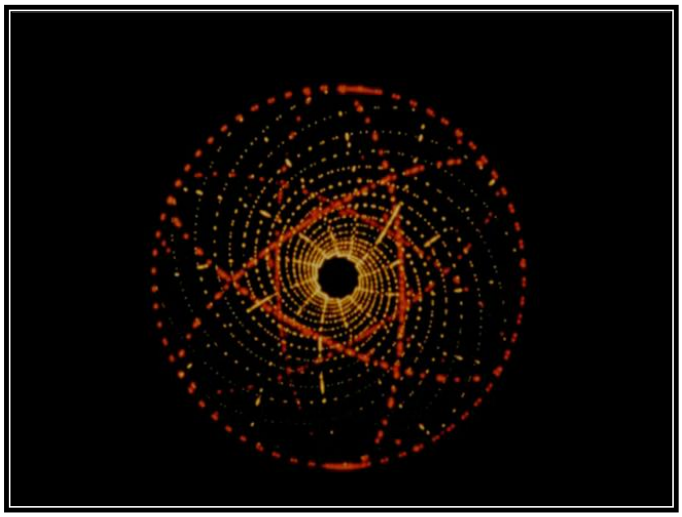

FIGURE 3.10: IMAGE FROM CYCLE SEVEN OF BELSON, *ALLURES* (1961), *OP. CIT*.

Cycle eight highlights a return to the graphic forms that were hinted at the beginning of the film. The rotating cycling elements in this cycle, however, are more intense, filling the screen and holding the viewer's already focused attention. The sound takes on a pulsating *warp* quality and begins to sound like maracas being shaken or rain on a tin roof.

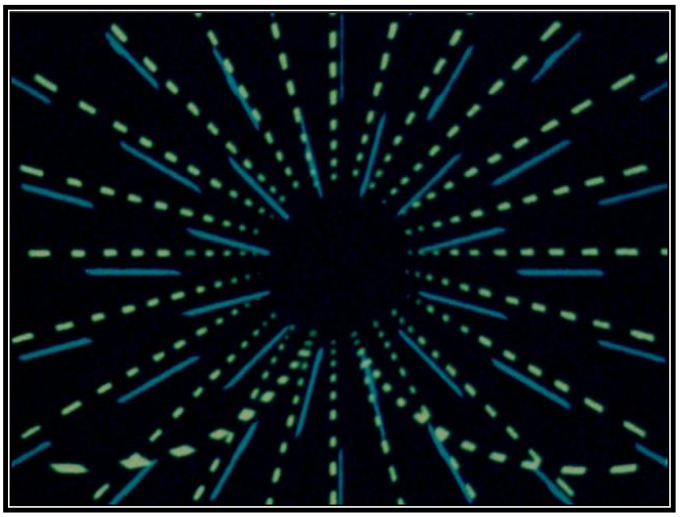

FIGURE 3.11: IMAGE FROM CYCLE EIGHT OF BELSON, *ALLURES* (1961), *OP. CIT.*

Cycle nine brings the film to a close. There are visual ruminations on elements that have been encountered in earlier cycles but with greater power, complexity and intensity. The mandalas in cycle nine are the most complex so far. The complex circular dot formations that comprise the mandalas are blown apart by some unknown force. This is bolstered by the force of the musical track. Presumably this is a manifestation of the psychic forces that push away the boundaries of conventional consciousness during meditation to enter a new higher realm of sublimnity. There is a return to the image of the hazy sun but this time it appears to be in the final throes of death, growing larger and hazier as it burns out. There is another brief glimpse of the spiral mandala but in this final cycle it is engulfed by a burning fire ball. Soft, slowly drifting pastel lights and delicate piano notes begin to slow the brain waves again with their gentle rhythm and soft tones. Rhythmically pulsating strobe lights guide the viewer out of the reverie induced by the film and back to reality.

FIGURE 3.12: IMAGE FROM CYCLE NINE OF BELSON, *ALLURES* (1961), *OP. CIT.*

SAMADHI (1964)

Belson's second phase consisting of gaseous films such as *Re-entry* (1964), *Phenomena* (1965), *Samadhi, Meditation* (1971) and *Chakra* (1972) seeks to stimulate the experience of mediation more obviously than perhaps *Allures* does. I would suggest that this can be attributed to Belson mastering a greater control over the production of real-time imagery and his increasing proficiency at achieving expanded states of consciousness through yoga. Belson's later films owe less to traditional or archetypal images associated with mystical experience related to the use of perception altering drugs or otherwise. The two dimensional plane of *Allures* over which flat geometric patterns and mandala derived shapes move are replaced by more diffuse, nebulous images that James refers to as a "quasi-illusionist interstellar space, in which light is an almost palpable though diffuse presence, often independent of the organic, nebulous shapes and forms upon which it falls."[1]

As previously stated composers and visual music filmmakers like James Whitney and Jordan Belson who wished to represent the spiritual in their music looked to the East for inspiration. Coomaraswamy prescribes nothing less than a total immersion in the discipline of Indian music as it not written and cannot be learned from books.

> … [I]t will be understood that the only way for a foreigner to learn it must be to establish between himself and his Indian teachers that special relationship of disciple and master which belongs to Indian education in all its phases: he must enter into the inner spirit and must adopt many of the outer conventions of Indian life, and his study must continue until he can improvise the songs under Indian conditions and to the satisfaction of Indian professional listeners. He must possess not only the imagination of an artist, but also a vivid memory and an ear sensitive to microtonal inflections.[2]

This view is echoed by Shankar who writes:

> As much as 90 percent of Indian music may be improvised and because so very much depends on understanding the spirit and nuances of the art, the relationship between the artist and his guru is the keystone of this ancient tradition.[3]

Whitney and Belson adopted a total dedication to entering into the "inner spirit" of Eastern philosophy. Belson in particular immersed himself completely in a rigorous Yoga discipline. The title of the film comes from Mahayana Buddhism and "refers to the total

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[1] David. E. James, *op. cit*., p. 128-129.
[2] Coomaraswamy, *op. cit*., p. 164-165.
[3] Shankar, *op. cit*.

union between the mind and its object of contemplation, a mental state that can be achieved only in the most advanced stages of meditation."[4]

Belson refers to *Samadhi* as a "documentary of the human soul."[5] He had a very specific aim with this film. He was attempting to achieve the state of *Samadhi*, "the state of consciousness in which the individual soul merges with the universal soul."[6] Mitchell has stated in interview that it is this state of Samadhi that he enjoyed while returning from space. He states:

> The experience in space was so powerful that when I got back to Earth I started digging into various literatures to try to understand what had happened. I found nothing in science literature but eventually discovered it in the Sanskrit of ancient India. The descriptions of samadhi, Savikalpa samadhi, were exactly what I felt: it is described as seeing things in their separateness, but experiencing them viscerally as a unity, as oneness, accompanied by ecstasy.[7]

Generally this state is sought through deep meditation and it seems the act of creating the film is actually functioning as a form of meditation. Not only this but it is also depicting the images and states that Belson himself is experiencing through this profound contemplation.

During the making of *Samadhi* he severed all external ties and dedicated himself entirely to his task. Such was his devotion to his task that in an interview with Gene Youngblood he confesses his surprise at not dying on completion of the film.[8] He sounds vaguely disappointed that he did not. Youngblood writes that in Mahayana Buddhism death is considered to be a liberation that "reunites the pure spirit of the mind with its natural or primal condition."[9] Life, tethering the mind to the body and the distraction of the senses, was deemed to be an unnatural state.

Samadhi, like *Allures* is a series of cycles. The colours of the images correspond to description in the Tibetan Book of the Dead of lights representing the elements Earth, Air, Fire and Water. It begins with the title "Samadhi" in traditional Arabic lettering appearing on screen as an eerie drone from a low wind instrument, not unlike a didgeridoo, sounds.

The first cycle opens with images of nebulous coloured clouds fading and out before swirling out of focus as the title splinters apart in a violent movement accompanied by a matching smashing sound. This is the *alap* that slowly introduces the main images

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[4] Powell, *op. cit*., p. 130.
[5] Youngblood, *op. cit*., p. 171.
[6] *ibid.*, p. 171.
[7] Edgar Mitchell, Interview, "Samadhi in Space: an Interview with Apollo 14 Astronaut Dr. Edgar Mitchell," Sarah E. Truman, 2007, http://www.ascentmagazine.com/articles.aspx?articleID=195&issueID=30 [Accessed: 27th May 2011].
[8] Youngblood, *op. cit*., p. 171.
[9] *ibid.*

that are encountered throughout the film. Following this *alap*, sun coloured clouds of gassy energy fill the screen dissolving to cumulonimbus cloud formations as the hum of the soundtrack swishes by. There is a constant fluctuation of colours and clouds pulsating in rhythm with the droning music. These thick clouds are superseded by visceral rays of molten light that seem to be escaping from the centre of the sun (see figure 3.13). The colour and texture is so intense that it almost seems possible that the rays will burn the celluloid.

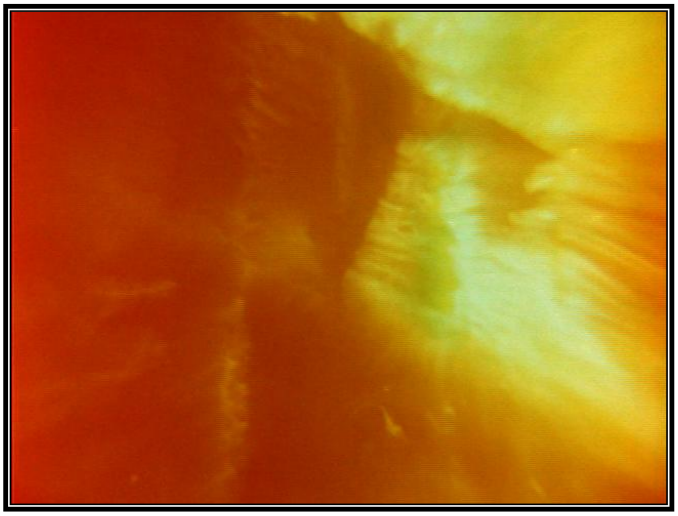

FIGURE 3.13: IMAGE FROM THE FIRST CYCLE OF JORDAN BELSON, *SAMADHI* (1964), JORDAN BELSON: FIVE ESSENTIAL FILMS [DVD], 2007, L.A: C.V.M.

The beginning of the second cycle and end of the first is marked only by a transition in the type of images that appear on screen. There is no break in the pulse of the music. The imagery in this cycle although still gaseous in appearance, like the images present in *Allures*, is more anchored to the centre of the screen. The hazy round images make visual references to planets or celestial bodies in the Milky Way. These planetary images grow increasingly unstable as the cycle progresses. As the images grow more unstable the soft electronic hiss of the music grows louder, giving the impression of swirling through the speakers. The colour warms from aqua blue to red before taking on the appearance of an alchemical green solar eclipse with the light of a green corona seeping beyond the edge. As the colours change so too does the tonal quality of the music. Swishing wind sounds correspond to yellow nebulous swirls while harder metallic sounds consisting of a low rumble superimposed with high electronic whistles accompany the churning blue clouds. The images soften to form loose nebulous rings consisting of thousands of particles moving in an anti-clockwise direction and small planet encircled by a large hazy doughnut. This image of a small planet recurs in the second cycle in varying colours representing the different states of matter - earth, fire, wind and water.

The most incongruous image in *Samadhi* appears in the second cycle. It looks like a boldly coloured circle on a boldly coloured background. Although it is referencing the flat boldly coloured circles that Belson used in *Allures* this particular image, when used in *Samadhi* has more depth and presence. In spite of its seeming solidity of the image in relation to the more gassy images that make up the majority of *Samadhi* Belson manages to work it smoothly into the cycle of images in the film. The images grow more and more nebulous as the cycle progresses forming loose rings swirling around a circular centre. The imagery disintegrates further to become amorphous nebulous rings. Finally, by the end of the second cycle there are just vapours of light remaining.

The final cycle reintroduces the nebulous rings and gassy clouds of the second cycle. The last unique image in *Samadhi* is that of a moon in being lit as it circles in orbit through the night sky. The gassy imagery of the beginning of the cycle becomes more tangible and begins to take on its moonlike appearance. Cosmic electronic sounds accompany this moon image. This image of the moon cycles through a range of colours until a yellow haze fills the screen, this too giving way to vacillating colour until it becomes a blue haze that the viewer travels through. This is reminiscent of a rocket passing through clouds in the earth's atmosphere. Rumbling electronic whistles that throb in time to the pulsation of the images highlight this connection as though the cosmic traveller is hearing this sound while breaking through the earth's atmosphere. The clouds resolve to a blue ring before vaporising to a blue circular misty mass. It fades to black marking the end of the film.

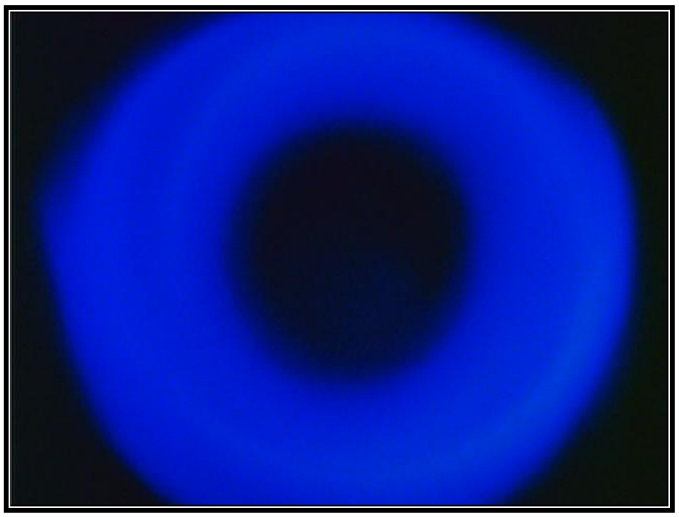

FIGURE 3.14: IMAGE FROM THE FINAL CYCLE OF BELSON, *SAMADHI* (1964), *OP. CIT.*

Belson looked on music as an integral part of his work, assembling his own soundtracks in relation to the images. He adopted a more synaesthetic approach to sound and image than that of Whitney, determined that the audience would not know if they were

"seeing it or hearing it."[10] Belson firmly believed that the two media "to be connected in their strong relevance to the subconscious mind and to basic psychological and physiological phenomena."[11] He claimed that electronic music makes use of reverberations of sound present in human perceptions when the brain does not repress them. This is reflective of the Indian spiritual belief that the vibrations in music correspond to the vibrations of the cosmos. Belson's soundtrack for *Samadhi* with its electronic rumbles and whistles bears a strong relation to the recording that NASA have made of the reflected electro-magnetic radiation signals of the planets in the solar system and such cosmological phenomenon as the aurora borealis in the North Pole so one is given the impression that they are listening and watching the music of the spheres.

There are many reasons why Indian music is a particularly apt model for the "cosmic cinema"[12] of Jordan Belson and James Whitney. It is fundamentally impersonal. According to Coomaraswamy it "reflects an emotion and an experience which are deeper and wider and older than the emotion or wisdom of any single individual."[13] He also writes that it is "not an art but life itself."[14] On a surface level Belson's films may seem personal. After all he is presenting his own personal experience of intense meditation in *Samadhi*. He also confesses that he does not make up the images in his films but has already seen them either externally or internally:

> I first have to see the images somewhere within or without or somewhere. I mean I don't make them up. My whole aesthetic rests on discovering what's there and trying to discover what it all means in terms of relating to my own experience in the world of objective reality. I can't just dismiss these films as audio-visual exercises. They obviously mean something, and in a sense everything I've learned in life has been through my efforts to find out what these things mean.[15]

Although Belson and Whitney may have *seen* the images with their inner or outer eyes I have already pointed out that these images are archetypal images associated with deep meditation, hallucination or drug use. They are also employing traditional Eastern imagery, representations of space and images from closed-eye vision that the viewer is most likely also familiar with and like a classical Indian musician playing a raga on a sitar they are creating an improvisation around a theme. Neither filmmaker is composing a visual music film but is assembling it.

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[10] Youngblood, *op. cit*., p. 155.
[11] Polta and Sandal, *op. cit*.
[12] Youngblood, *op. cit*.
[13] Coomaraswamy, *op. cit*., p. 169.
[14] *ibid.*, p. 170.
[15] Belson cited in Youngblood, *op. cit.*, p 159.

To conclude, this chapter has determined that on the West Coast of America during the fifties and sixties there was an evolution in the aesthetic and philosophical paradigm of the visual music film. The hard lined formal absolutism of the German modernist filmmakers ceded to a more nebulous abstruse spiritualism that was underpinned by a profound spirituality. This was due to several reasons; the influx of the European avant-garde in the post war period, the establishment of the *Art in Cinema* screenings in San Francisco in the late 1940s, changing viewing contexts, a rise in the practice of Eastern religions and the use of perception altering drugs such as LSD, mescaline and peyote by the counterculture in their search for a transcendental experience. These factors combined to form a rationale for James Whitney and Jordan Belson's unique expression of spirituality in their highly idiosyncratic visual music films.

Ultimately this chapter demonstrates that just as music can function on both a formal and a spiritual level simultaneously so too can visual music films by virtue of their inherent musical qualities. It also reveals that there is no standardised form of analysis that can be universally applied to all visual music film. Just as Eastern music does not fit into traditional Western forms of musical analysis neither do the visual music films of Belson and James Whitney that are looking East for inspiration.

CHAPTER 4:

EXPERIMENTATION AND TECHNOLOGICAL INNOVATION

This thesis has hitherto explored the visual music film from a more theoretical perspective, focusing firstly on how musical philosophy can be used to underpin the visual music film conceptually and secondly on how philosophical or aesthetic concerns can affect the particular aesthetics and form of the visual music film. However, visual music has always been intrinsically bound to technological experimentation and innovation by individual filmmakers as they strive to express music in visual terms. This chapter will explore the technology employed by individual visual music filmmakers in their craft. Although there are many technical processes used in the creation of visual music films, this section will consider what I have deemed to be three major areas of technical advancement. It will begin with the development of colour processing and the effect that it had on the visual music film (illustrated through the example of *Kreise* (1935) by Oskar Fischinger). Secondly, it will investigate the direct-to-film animation techniques used by Norman McLaren and Len Lye by specifically focusing on *Begone Dull Care* (1963) by McLaren and *A Colour Box* (1935) by Lye.

Finally, following on from this exploration of visual animation techniques, this chapter will closely scrutinise the techniques used for creating an animated synthetic soundtrack. Norman McLaren writes that the term synthetic sound as pertaining to the soundtrack more generally encompasses a variety of "new, non-traditional methods of making noise, sound effects, music, and speech, by electronic, magnetic, mechanical, optical, and other means."[1] He prefers to use the term *animated soundtrack* in a more restricted fashion, choosing to refer to a method of "producing sound on film which parallels closely the production of animated pictures"[2] and this is the meaning that I use here.

Two different schools of thought emerged surrounding the animated synthetic soundtrack. The first, exemplified by engineer Rudolf Pfenninger and Bauhaus artist Laszlo Moholy-Nagy, was inherently logical, eschewing an aesthetic discourse. Advocates of this school were concerned with technical development that created a new form of sound writing free from the constraints of existing institutions and notation. The second type of synthetic sound, as developed by Fischinger in his animated sound experiments, was designed to create a greater unity between picture and sound in addition to exploring

[1] McLaren, "Animated Sound on Film." *op. cit*., p. 166.
[2] *ibid.*

the relationship between graphic forms and their auditory counterparts. Rather than study the graphic forms that tones produced as Pfenninger did, Fischinger explored what sounds particular graphic forms produced. The *Pfenninger approach* to the animated soundtrack will be considered through close analysis of *Synchromy* (1971) by Norman McLaren, a film in which the actual drawn soundtrack appears on screen, while the *Fischinger approach* will be illustrated through the Optical Sound films *Sound Shapes* (1972), and *Phase Loop* (1971) by English filmmaker Guy Sherwin.

In his 1976 "Theory and Definition of Structural/Materialist Film," filmmaker Peter Gidal writes that in "arts that seek to ask questions"[3] new technical practice has an effect on aesthetic practice. Likewise technique is inseparable from aesthetics. To paraphrase Gidal, the involvement with technique has two results:

1. Inventions make the development of a new aesthetic possible;
2. Aesthetic usage is inseparable from technical possibilities.[4]

Even though Gidal was referring expressly to the Structural/Materialist films that were being produced by filmmakers associated with the London Filmmaker's Co-operative in the 1960s and 1970s this idea of technological invention influencing aesthetic and aesthetic influencing technological invention can be extended to visual music animation.

The early part of the twentieth century was an era of accelerated movement. It was the age of the Technological Revolution that nipped at the heels of the Industrial Revolution ushering in the great transcontinental railways and revolutionary processes for mass production. There was an emphasis on dynamism and speed and this began to make its way into the world of art in the guise of the kinetic orientated stream that flowed through the art movements of Impressionism, Post-impressionism, Cubism, Expressionism, Constructivism, Futurism and Abstractionism. This stream culminated in the composition of cinematic paintings infused with motion that had the added element of time such as *Rhythmus 21* and *Symphonie Diagonale*.

Cinema and painting have traditionally crossed paths, symbiotically augmenting and inspiring the developments of one another. The initial visual music films were the earliest attempt to bring painting and cinema together, responding to a kinetic urge that was being called for in an age of accelerated motion. Artists sought to energise their static images by imbuing them with the qualities of motion and temporality. Hans Richter writes:

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[3] Peter Gidal, "Theory and Definition of Structural/Materialist Film," in *Structural Film Anthology*, 1976, London: B.F.I., p 10.

[4] *ibid.*

> Problems in modern art lead directly into the film. Organisation and orchestration of form, colour, the dynamics of motion, simultaneity, were problems with which Cezanne, the cubists, the futurists had to deal.[5]

It was the invention of the camera and film projector that allowed painters Hans Richter, Viking Eggeling and Walter Ruttmann to introduce the element of motion and temporality to their paintings and allowed them to create a time-based visual experience that could approach the state of music.

THE COMING OF COLOUR TO FILM

In addition to the invention of the film projector and camera, another important technological advancement to emerge at the turn of the twentieth century was the development of colour processing. Colour is an essential element of the visual music film, allowing the filmmakers to more accurately capture the nuances and subtleties of music. Rather than relying on rhythm and shape to represent music, visual music filmmakers could exploit the different hues, intensities and combinations of colour to create more complex audiovisual compositions. Of course some musical and visual styles call for a more restrained use of colour and form but the coming of colour to film unlocked a myriad of potential for the visual music film.

However, the initial attempts at physically creating visual music films by Eggeling and Ruttmann were black and white affairs. One can speculate that this can be attributed to a number of reasons.

1. Eggeling and Ruttmann had limited skills and knowledge of the technical process of animation and relied on others for support in this area.
2. Although colour processing had been experimented with since the end of the nineteenth century, commercial methods of processing film stock did not yet extend to colour processing.
3. Both Ruttmann and Eggeling's scroll drawings that they later developed into visual music films were predominantly monochrome and formal in construction and presumably they wished to extend this aesthetic into their films.

Although colour processing was not an option for filmmakers in the early twentieth century, there were attempts to utilise colour in film. Early filmmakers such as Georges Méliès and D.W. Griffith used hand-tinting techniques and processes that were originally developed for stills photography.

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[5] Hans Richter, "The Film as an Original Art Form," *College Art Journal*, Vol. 10, No. 2 (Winter, 1951), College Art Association, p. 160.

Walter Ruttmann made an attempt to introduce colour into his *Lichtspiel* films but this was achieved by hand-tinting and toning the negative. This was an extremely laborious approach to applying colour as it involved colouring the emulsion of the film so that the dark areas are given a colour hue, dying the celluloid strip in order to give the light areas another colour and finally painting directly onto the film strip in order to give specific shapes a particular colour.[6] Each scene required a separate printing and each projection print had to be assembled from small fragments. Ruttmann loosely employed colour in his first two *Lichtspiel* films in order to create expressionistic moods reflecting the spirit of the music, for example the use of the colour blue in the second elegiac movement of *Lichtspiel Opus I*.

Tinting and toning were time-consuming, labour intensive and expensive processes and so were beginning to be phased out by the end of the 1920s. As mentioned above, experiments with colour processing date back to the very end of the nineteenth century, but colour films were not widely circulated until the 1930s. Various methods were trialled by pioneers. George Albert Smith developed the two-strip Kinemacolor process of running black and white film at double speed, while rotating filters applied the colours red or green to each alternate frame. A similar process would be used during projection of the film in order to create a primitive colour system. Smith's system can be seen in his 1906 film *Tartans of Scottish Clans* and came to be a major colour process used in Great Britain in the early part of the twentieth century.

Another colour process in circulation at the conception of full colour visual music films was Dufaycolor. Len Lye used Dufaycolor for two films in 1935, A *Colour Box* and *Kaleidoscope*. Lye was disappointed by the muted colour produced by the process especially in relation to the vibrant images that he had painted directly onto the film stock in both films. This disappointment reflects the importance that Lye and many of his contemporary visual music filmmakers attached to colour and the dynamic energy that it could bring to a film, extending the potential for better capturing the nuances and subtleties of music.

Once colour became a feature of mainstream cinema, there was a constant striving to achieve ever more natural looking tones and colours that were reflective of those found in the real world. However, as demonstrated in Lye's disappointment with the tones produced by the Dufaycolor process, the visual music filmmakers were less interested in capturing reality and natural colours and were more concerned with achieving vibrant,

[6] William Moritz, "History of Experimental Animation," *Absolut Panushka*, curated by Christine Panushka, (Jan-Apr 1997), http://www.iotacenter.org/visualmusic/techniques/techtinting [Accessed: 26th May 2011].

intense colour saturation that could better represent the richness of music and/or have a greater emotional effect on audiences. This is one of the reasons why the process of *Gasparcolor* became so intrinsic to the visual music films of Fischinger and Lye.

Gasparcolor is intimately linked with the development of the colour films of Oskar Fischinger. It was first created by Hungarian chemist Bela Gaspar and his brother Imre in 1932 and used a subtractive process not dissimilar to the one that Technicolor was using during the same period.[7] However, there was one major difference between the two processes. Gasparcolor employed three separate emulsion strips rather than two. These three strips used a magenta and yellow layer on one side and a cyan-blue layer on the other. This allowed Gasparcolor prints to be made from any three colour separation negative. This is why the colour produced by the Gasparcolor process was so rich, vibrant and particularly suitable for the type of visual music being produced by Fischinger. There were two processes through which Gasparcolor prints could be made. The first entailed using a single strip of black and white film being subjected to three successive red, green and blue exposures to produce the final colour image. The second, more precarious method, involved the use of three separate strips of black and white film, each strip containing different individual colour sensitive information. The first method proved to be more favourable as it required only a single pass to create a print. The second method, which was essentially the same method that Technicolor was employing at the time, required the print to be rewound twice thus leaving the print open to the dangers of scratching or misalignment of colour.[8]

Aside from the convenience and relative safety of the Gasparcolor process compared to that of Technicolor in the same period, the unique chemical formula of Gasparcolor produced intense colour saturation, which made it the perfect format to capture the vibrancy and movement in Oskar Fischinger's animations. Moreover, once Gasparcolor, like many of the animations for which it was intended, became a victim of the

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[7] In the subtractive process the camera negative holds both red and blue-green versions of the filmed material. The blue-green image is upside down while the red image is the right way up. Matrix film stock that is half as thick as normal film stock is used to make two separate mirror image prints that are placed back to back following the application of colour dyes. These matrix films contained both the typical light sensitive silver halides that are constituent elements of black and white film and a gelatin layer. On development, the silver halides are removed leaving the layer of gelatin with a map of the image embedded in it. The celluloid was then placed on a dye bath of a colour that was complimentary to the original colour image. Subsequent to this application of colour dyes, the two half thickness prints were connected back to back to create the final projection print. For a further explanation of the technical processes involved see Scott Higgins, "Technicolor: "Early Three-Colour Aesthetics and Design," *Film History*, Vol. 12, No. 4, Color Film, 2000, Indiana University Press, pp. 358-383 and "Technology and Aesthetics: Technicolor Cinematography and Design in the Late 1930s," *Film History*, Vol. 11, No. 1, Film Technology, 1999, Indiana University Press, pp. 55-76.

[8] William Moritz, "Gasparcolor: Perfect Hues for Animation," Lecture at Musée du Louvre, Paris. http://www.oskarfischinger.org/GasparColor.htm [Accessed: January 27th 2011].

Second World War and the company was forced to relocate to London, it was the colour process to which Lye turned to help capture the bright colours that he hoped to replicate in *A Colour Box* and *Kaleidoscope* (1935).

Fischinger was instrumental in the development of Gasparcolor. Like many of the visual music filmmakers that this thesis has looked at, he was extremely technically proficient and had originally trained as an engineer, draftsman and tool designer at the Pokorny and Wittekind Machine Manufacturing factory in Frankfurt. This invaluable training would allow Fischinger to build and design his own animation and sound recording equipment and, more importantly for the development of colour animation, put him in a position to engineer a camera mechanism that synchronised the shutter with the wheel which contained the three filters that rotated to produce the three different colour exposures (cyan, yellow and magenta).

KREISE (1933)

In 1933 Fischinger used the Gasparcolor process to create an animated commercial for German advertising agency Tolirag. He had initially intended for the film to function as an absolute animation in its own right but Fischinger could not get a permit from the Nazi censorship board, who considered abstract art to be degenerate.[9] Fischinger circumvented the problem by adding the title card "Tolirag reaches all circles of society"[10] to the completed film.

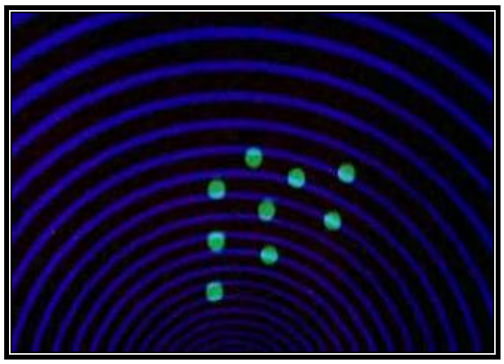

FIGURE 4.1: STILL FROM OSKAR FISCHINGER, *KREISE* (1933), OSKAR FISCHINGER: 10 FILMS [DVD], 2006, L.A: C.V.M. ILLUSTRATING THE AESTHETIC PRESENT IN THE FIRST HALF OF THE FILM ORIGINALLY DERIVED FROM CHARCOAL DRAWINGS.

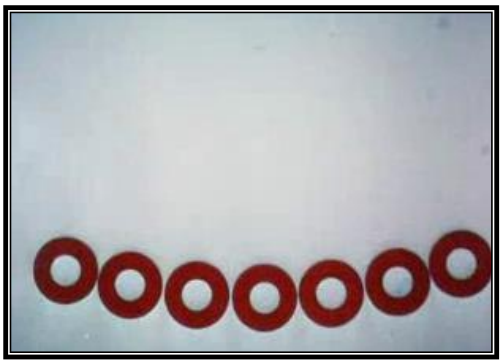

FIGURE 4.2: STILL FROM FISCHINGER, *KREISE* (1933), *OP. CIT.* ILLUSTRATING THE AESTHETIC PRESENT IN THE SECOND HALF OF THE FILM DERIVED FROM PAINTING ONTO PAPER WITH TEMPURA PAINT.

[9] William Moritz, "Gasparcolor: Perfect Hues for Animation," *Animation Journal 5*, Maureen Furniss, Ed., (1996), p.55.

[10] Fischinger, *op.cit.*

Fischinger melded excerpts from two musical compositions, Grande March from Wagner's 1845 opera "Tannhäuser und der Sängerkrieg auf Wartburg" and the "Hyldnings Marsch (Homage March)" from Norwegian composer Edvard Grieg's 1872 orchestral suite "Sigurd Jorsalfar Op.56." The title of the film, *Kreise* (Circles), is formed from small evenly sized circles on a background of rings and signals; the structural theme of the film. Just as Richter uses squares as his basic compositional unit in *Rhythmus 21* and McLaren uses the straight line in *Lines Vertical* and *Lines Horizontal*, Fischinger relies on coloured circles to compose his "colour play."[11] Fischinger executed the first half of the film by drawing the circles with charcoal before subsequently adding colour by using colour filters during processing. The images for the second half were produced by Fischinger painting onto white paper with tempura paint. This makes for a different aesthetic in each half.

The images from the first half of the film are synchronised to "The Grand March" from Wagner's opera "Tannhäuser." The appearance and movements of the visual shapes correspond to musical phrases. They do not have a synaesthetic equivalency to the notes of the march but rather conform to the timing and timbre of notes and phrases. For example, the opening figure of the Tannhäuser excerpt is two bars long and composed of a series of visual figures based around the central theme of the circle. This could be considered to be a precursor to Belson and Whitney's films. Both Belson and Whitney, as stated previously, were extremely influenced by the work of Fischinger, which they were privy to at the *Art in Cinema* screenings. Moreover Moritz suggests that Belson was extremely interested in spiritualism and Buddhism[12] so it is not surprising that the circle would play such a prominent role in a film of Fischinger's.

1. The sound of a crashing cymbal marks the beginning of the first note as a red circle on radiating blue rings.
2. The second note invokes green dots sweeping upwards on the bed of blue rings. The rings swap spatial position half way through the note. The length of the movement of the circles reflects the length of the note.
3. Groups of green dots appear and move downwards in response to the third note.
4. A red elongating circle shoots from the bottom left corner to the top right corner.
5. The end of the bar is marked by the forms of two somersaulting shapes. These forms repeat three times in correspondence with the simultaneously repeating musical figure. If you look closely, the elongated blue and green circular shapes

[11] A title card at the beginning of the film refers to it as "Ein Farbenspiel," which translates from German into English as "A Colour Play."

[12] William Moritz, *An Optical Poem: The Life and Work of Oskar Fischinger*, 2004, Indiana: University Press.

are actually circles with slightly lighter tails coming out of them that could be due to the persistence of vision or the streaking effect that can occur in films using the Gasparcolor process. Also present on screen are pin pricks of red circles resting beneath these revolving shapes. They have the appearance of city lights being viewed from a height.

6. Fischinger repeats certain phrases again. The red dots swing up again, followed by green circles and the red ellipses again elongate in response to the duration and shape of the corresponding musical notes.

Now that Fischinger has established this pattern he repeats it again for emphasis, wedding visual figures and phrases to musical ones and reusing them whenever the musical ones are repeated.

At the moments of forceful crescendo and clashing symbols, throughout this movement coloured circles at different points in the screen change in size in response to the music. There are points in this movement when the arrangement of the circles on screen could be a symbolic representation of the way in which an orchestra is organised on stage, for example, in one figure the blue circles arranged in a semi-circle in the foreground mirror the location of the strings found on stage, the green semi-circles are placed where the wind and brass instruments are found and the red circles in the background are positioned where the percussion section generally resides. At the points where the circles overlap, the closed curves form a Venn diagram, creating an entirely new colour at the intersection.

Fischinger continues his coloured interplay of circles as this movement continues; interpreting the *spirit* of the music and changing shape and placement to reflect that of Wagner's score. There is a certain playfulness to the arrangement of the circles. At times they resemble geese flying in a loose v-formation or ice-skaters skimming over ice in choreographed movements.

The second half of the film retains the image of the circle as its visual theme but the black background is replaced by white. There is a transformation in mood and movement of the film with the change in music. The second uses semi-circular bands of circles within circles that radiate and pulsate upwards and outwards in exact synchronisation with the brass sections of Grieg's "Homage March."

The most striking aspect of *Kreise* is the vividness and richness of the colour. There is a consistency and evenness to the distribution of colour across each circle and ring so that there is no evidence of a drawn edge or fading. The colour is so brilliant and lustrous that it almost appears to have been rendered digitally rather than by hand. Even

though the hue and colour saturation is still so visually arresting, one must bear in mind how striking and innovative the film must have seemed to audiences at its time of completion.

As previously mentioned, *Kreise* is split into two distinct halves, with the transition between halves marked by a change in score and background colour. Fischinger weaves together excerpts from Wagner's Grande "Tannhäuser und der Sängerkrieg auf Wartburg and "Sigurd Jorsalfar Op.56." One of the reasons that the two pieces can be integrated so efficiently is due to the fact that both excerpts are marches that share the same 4/4 time signature. The instructions on both of the scores call for an allegro tempo at the beginning signifying a b.p.m. (beats per minute) of between 120 and 168 which is typical of a march.[13] [14] This beat matching makes for a smooth transition between the two musical compositions.

The march proves to be a particularly apt musical form for Fischinger's Gasparcolor experiments. Marches were initially designed for marching to by military legions and therefore employ a strongly accented regular rhythm. Neither Wagner's nor Grieg's marches were intended for military tattoos. There was a growing trend amongst classical composers in the nineteenth century to incorporate marches into operatic and symphonic works. Both Grieg and Wagner use traditional orchestral instruments rather than relying on those used by military bands, such as brass instruments underscored by a repetitive snare drum. Therefore it is mainly the tempo, time-signature and instrumentation that mark Wagner and Grieg's work out as marches. In addition to sharing similar physical characteristics both pieces express a certain stateliness and aura of national pride. Wagner was notoriously obsessed with representing the idea of *German Spirit* in his music and titled the March section of his celebration of Germanic legends "The Grand March." The first page of the musical arrangement for the March calls for it to played in a *maestoso* fashion. The term *maestoso* is an Italian musical term meaning majestic. In musical parlance it is taken as an instruction to perform a musical composition in a stately and dignified manner and is taken to be synonymous with a march. It can also be used to refer to musical sections that should be played triumphantly, like a fanfare. Likewise

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[13] Edvard Grieg, "Three Orchestral Pieces," *Sigurd Jorsalfar*, arr. of Op. 56 (Drei Orchesterstücke aus *Sigurd Jorsalfar*), *Edvard Grieg: Werke für Klavier zu 2 Händen, Band III*, Hermann Kretzschmar (Ed.), 1907, Leipzig, C.F. Peters, Ed.3100, Plate 10038. Reprinted: Norwegian Dances and Other Works for Piano, 1991, Mineola, Dover Publications, http://imslp.org/wiki/Special:ImagefromIndex/00574 [Accessed: January 31st 2011].

[14] Richard Wagner, "Act II, Scene III, Scène et Grande Marche," *Tannhäuser* (Piano Score), Hans von Bülow and Ernest Guiraud (Arr.), n.d., Paris, Durand, Schoenewerk et Cie., n.d., plate D. S. & Cie, 1709, pp. 120 – 129, http://imslp.info/files/imglnks/usimg/b/b3/IMSLP15597Wagner_Tannhauser_3_Acte2_Scene3_piano_4_hands.pdf [Accessed: January 31st 2011].

Grieg's "Hyldnings Marsch" was part of a larger suite celebrating King Sigurd I of Norway and is also a majestic affair. Fischinger tried to capture this sense of majesty in *Kreise* through the rising motion of the circle that match the triumphal breathing of the trumpets and are reminiscent of the overlapping Olympic Rings. The bright colours of the film are reflective of the pageantry of military marches and provoke a pseudosynaesthetic response in the viewer due to the bright colours reinforcing the triumphant spirit of the music.

These romantic and stately qualities that both composers were striving to represent in their work lend themselves well to creating lively visuals. Both musical compositions have a wide dynamic range wedded to a constant rhythm that makes them easy to both conceptualise and synchronise visual images to, thus allowing Fischinger to concentrate on developing colour techniques.

The grafting of the Wagner and Grieg pieces were particularly suitable for Fischinger's task. The marrying of the coloured images with the music was an excellent example of Gesamtkunstwerk. Wagner, as I described in earlier chapters, used the term Gesamtkunstwerk in relation to events that combined multiple arts into a universal total artwork. *Kreise* in many ways is a total artwork fusing colour, choreography, visual art and music into a theatrical whole.

Fischinger used the Gasparcolor process for two more films, his 1934 advertisement for the Muratti cigarette company entitled *Muratti Gets in the Act* and his 1935 film *Composition in Blue*. He had intended to use the process for his film *Quadrate* in 1934. The completed film consists of a loop of 271 paintings of squares moving towards or away from the screen. Fischinger had planned for the three colour separation negative of squares to be printed in different colour combinations by switching the colour filters and order of exposures for each repetition. This would have allowed for infinite colour variations on the same composition of squares. It fell afoul of the Nazi censors however and was eventually made using a different type of colour printing.

Fischinger was not the only animator to see the potential of the three strip Gasparcolor system. New Zealand animation pioneer Len Lye, however, arguably did the most to build on Fischinger's initial experiments and development of Gasparcolor. If the visual music filmmakers deemed the Gasparcolor process to be so superior to other available colour processes in the 1930s due to its chemical stability and capacity for capturing subtleties of tone in such a vibrant and rich manner,[15] why then was it not more widely adapted by not only other visual music filmmaker but the film industry at large?

[15] Moritz, "Gasparcolor" *op. cit.*

Gasparcolor and the British Kinemacolor two-strip process were surpassed by the American Technicolor process that would become the dominant method for creating colour film in Hollywood from 1922-1952. The Technicolor Company's first colour process was a two colour additive system that was not dissimilar to the Kinemacolor method.[16] Technicolor abandoned this additive process in favour of a subtractive one three strip process. This method of colour processing created not only sharper images but also allowed for a natural colour process that could be run through standard film projectors and was destined to be the dominant process used for visual music films post World War Two.

Although this thesis is concerned primarily with absolute visual music films it would be remiss not to acknowledge the introduction of colour into programmatic visual music films. Disney had been creating figurative equivalents of visual music with *The Silly Symphonies* series of animations since their 1929 film *Skeleton Dance* in which film human skeletons dance around a graveyard to the musical composition "Dance Macabre" by Romantic composer Charles-Camille Saint Saëns.

On seeing tests for a new three strip colour process that was being developed by Technicolor Walt Disney signed a three year deal in 1932 that provided the Disney corporation with exclusive rights to the new process with the result that competitors such as Max Fleisher, who created the successful *Betty Boop* series, were forced to use the inferior two-strip Technicolor process for their animations.[17] Walt Disney was so eager to avail of the colour process that he insisted that *Flowers and Trees*, a musical animation, in which the flowers and trees of a forest awaken and move in response to the musical soundtrack, be scrapped and re-made using the new process, despite being almost complete.

Even though the colours of the three strip Technicolor process are more vivid than those produced by the two strip process they lack the vibrancy and saturation of Fischinger and Lye's efforts with Gasparcolor. *Flowers and Trees* is a more subdued affair than *Kreise* or *Rainbow Walk*. Although it could be argued that the use of more restrained hues in this film were a result of the pastoral and nostalgic film style I would argue that the Technicolor process was not yet equipped to render the effervescent and rich saturation offered by Gasparcolor. It was not until Technicolor began to incorporate elements of

[16] There were some differences between the Kinemacolor and Technicolor processes however. In the Technicolor system there was no rotating colour wheel and the camera recorded red and blue-green images simultaneously through a single lens with a beam splitter and colour filters placed one on top of the other to record the images. The resulting black and white print produced was run through a special projector that was fitted with two apertures and lenses with colour filters that added the tint on projection.

[17] Scott Higgins, *Harnessing the Technicolor Rainbow: Color Design in the 1930s*, 2007, Texas, University of Texas Press, p. 26.

other colour processes such as Gasparcolor into its own system that it became capable of rendering the rich tones and saturation that was seen in films such as *The Wizard of Oz* (1939). An additional reason why Gasparcolor animations such as *Kreise* still seem so vibrant nowadays is due to the stability offered by the Gasparcolor process. There was less fading and degradation to the film stock of Fischinger and Lye's Gasparcolor films than visual music films produced using alternative colour processes and this is one possible explanation as to why they still exist and have enjoyed a greater distribution over the years than many other visual music films.

Although Gasparcolor could never compete against companies such as Technicolor that dominated the film processing industry in Hollywood, it still remained vital to the visual music films of Fischinger. He remained committed to the process for as long as he possibly could, seeking out remaining stocks for *Allegretto* (1943) and *Radio Dynamics* (1943). Moritz refers to these films as "a swan song for Gasparcolor."[18] This demonstrates the importance and centrality of the Gasparcolor process to Fischinger's work. The range of tonalities and vibrancy of the colours that were achievable with Gasparcolor were of particular importance in the silent *Radio Dynamics*. The pulsating effervescent shapes vibrate on the screen so sensuously that to add a layer of music would potentially detract from the dynamism of the imagery. Just as other visual music filmmakers such as Eggeling and Richter attempted to orchestrate shape and form, Fischinger was orchestrating his compositions with colour and for this, no other colour process would do.

DIRECT ANIMATION TECHNIQUES

This chapter has so far demonstrated that the development of the visual music film was intimately bound to the techniques pioneered by individual animators and vice versa by playing close attention to Fischinger's involvement with the Gasparcolor process. One of the prevailing methods that enjoyed widespread use in the composition of visual music films was direct/cameraless animation, which involves drawing, painting, stencilling or scratching directly onto the surface of the film stock.

Futurist artists and brothers Ginna and Corra had created hand-painted animations as early as 1910. There are no surviving examples of these films but their film notes documenting the processes that they used exist in their 1912 essay "Abstract Film –

[18] William Moritz, "Le Gasparcolor: Une Procédure Chromatique," Lecture, Musée du Louvre, 6 October 1995, http://www.iotacenter.org/visualmusic/articles/moritz/gaspar [Accessed: February 9th 2011].

Chromatic Music." Likewise Leopold Survage set out drawings for an intended hand-painted visual music animation around the same time. The earliest surviving visual music films by the German modernists in the post-world war one period had used the camera to pictorially depict music. Richter had photographed primitive shapes frame by frame using a rostrum camera whilst Eggeling had used the camera to convert his scroll drawings into moving images.

There was a simultaneous but independent rediscovery of hand-painting from the 1920s onwards. Len Lye had adopted the process for his 1929 film *Tusalava*. At the same time Oskar Fischinger was using the process in Germany, while Norman McLaren had begun to use the method for creating his abstract animations while studying at the Glasgow School of Art. Meanwhile Harry Smith, on the west coast of America, ignorant of other attempts at direct animation, had thought that painting directly onto celluloid was unique to him. At first glance it may seem technologically regressive for visual music filmmakers to revert to laborious hand-painting techniques, especially with the advancements in camera and film processing technology, but there were certain benefits to cameraless animation. Painting directly onto the filmstrip was less expensive then camera based animation as it circumvented the need for expensive camera equipment and processing. Norman McLaren began to use the method during his time at art school because, financially, painting on film stock with the emulsion stripped back was the only option open to him. Likewise Len Lye's use of the process for *A Colour Box* in 1935 came about because he had naively told John Grierson that he could create a film for the G.P.O film unit for under £5.00. The second reason that painting directly onto the film strip seemed so attractive is due to the intense physical relationship that it generates between the filmmakers and the film material. A.L. Rees refers to it as "a primal means of filmmaking." This sense of primacy is evident in Harry Smith's visual music films *Early Abstractions* in which his alchemical musings are made concrete through his complex batiks and cellular images. In the same fashion Lye's first animated film *Tusalava* (1929), which is the Samoan word for "in the end everything is just the same,"[19] allows him to engage with the weight of Samoan primeval thought about the interconnectedness of all living beings. The simple organic forms etched into the emulsion of the film like early drawings scratched into the walls of caves allows Lye to make a material connection between the philosophy and history that he is attempting to portray and the material of the film in its most basic unadulterated form without intercession. This renders it a particularly appropriate approach for the visual music filmmakers who endeavoured to capture the affect and spirit of music as intimately

[19] David Curtis, *A History of Artist's Film and Video in Britain*, 2007, London: B.F.I., p. 134.

as possible.

Painting on film typically took one of two approaches. The first approach entailed painting straight down the transparent filmstrip, allowing the projector to create the frame edge and giving the impression of speed and movement. The second approach necessitated dividing the strip into frames and painting or etching each frame separately. The first approach can be seen in animations such as *A Colour Box* by Lye and *Fiddle-de-Dee* and *Begone Dull Care* by McLaren. The second is evidenced in McLaren's film *Love on the Wing*.

A COLOUR BOX (1935)

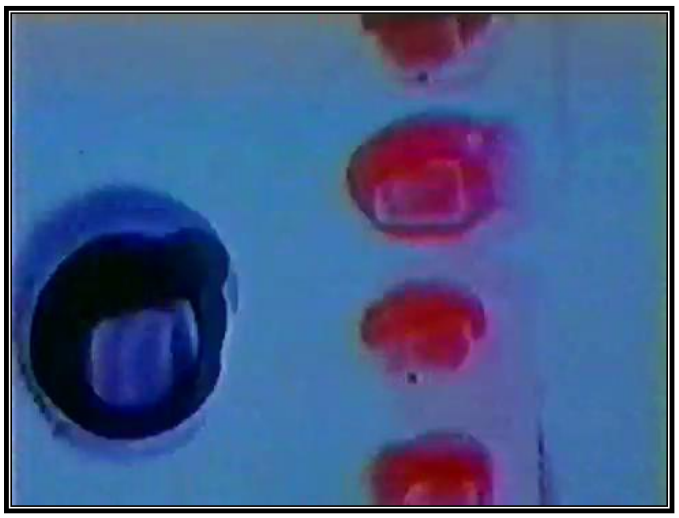

FIGURE 4.3: STILL FROM LEN LYE, *A COLOUR BOX* (1935)., ROYAL MAIL FILM CLASSICS, 2005, BUFVC, HTTP://EDINA.AC.UK/PURL/ISAN/0013-0000-3537-0000-0-0000-0000-0.

After being privy to a series of animation experiments undertaken by Len Lye, John Grierson charged him with making an abstract animation to advertise parcel post in 1935. The result was *A Colour Box*, a tour-de-force of colour and shape, loosely synchronised to Cuban Jazz composition "La Belle Creole" by Don Baretto and his Cuban Orchestra. Lye's regular musical collaborator Jack Ellitt edited and mixed the recording and transcribed the dynamics into graphic markers that ran along the edge of the filmstrip. This is a similar process to the one used by McLaren in animation where he used music as the undergirding for his images. Lye painted and drew coloured lines and abstract shapes onto the filmstrip that corresponded to these markers ensuring that the rhythm of the visuals corresponded to the jaunty pace of the Jazz music. This completely inverted the image/sound relationship of *Tusalava*, Lye's first cameraless visual music animation, for which the score was created on completion of the visuals.

Lye was constantly experimenting with animation techniques and asserts "[e]very

film I got from the G.P.O. I tried to do something new. Every film I did was something not previously done in film technique."[20] In the case of *A Colour Box* Lye experimented to come up with his own methods of direct animation and visual music in order to further his fundamental and enduring concern of exploring motion:

> I'm personally not a literary type. I can't create anything out of a literary form that I think is as significant as anything I can create out of a figure of motion. I look at film in a different way from most people. ...I'm interested in composition with motion.[21]

In the case of *A Colour Box* this was via painting directly onto film. Lye's rationale for eschewing the use of the camera was partly out of economic necessity. As mentioned previously, he had promised Grierson a film for £5.00. This should not detract, however, from the levels of sophistication that Lye achieved through his use of the technique. McLaren writes of the effect and influence that seeing *A Colour Box* had on him and his own work with direct animation.

> Although I did not work in close proximity to Len Lye when at the G.P.O film unit, and although I started direct drawing on film independently of him, his films have always put me in a state of dithering delight and therefore should be counted as a formative influence.[22]

Additionally, McLaren posits that monetary and/or technical constraints could serve to stimulate the imagination:

> All arts need restrictions and limitation. The sonnet form, the fugue, the Roman viaduct, and the suspension bridge, the conventions of ballet, all point to the value of limitations. These of course are technical limitations, but I do think that financial limitations too play a positive role in moulding and developing an art; in fact, they often shape technical, stylistic and esthetic ones in fundamental and healthy ways...[23]

The techniques developed by Lye for his cameraless animations are crucial to the aesthetic of the finished film. Lye created stencils by cutting shapes out of thin cardboard with a razor blade and used an airbrush to apply thin layers of paint through this stencil designs. Lye tended to use both sides of the film in order to play with colours and layers. In addition to using air-brushes to apply paint, Lye also employed instruments like combs and camel hair brushes to build up layers of colours and textures in order to create images that were apposite to the music.

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[20] Len Lye, "Talking About Film," *Experimental Animation: An Illustrated Anthology*. Robert Russett and Cecile Starr (Ed.s), 1976, N.Y.: Van Nostrand Reinhold, p. 68.

[21] *ibid.*, p. 66.

[22] Norman McLaren cited in "Norman McLaren and the National Film Board of Canada" *Experimental Animation: an Illustrated Anthology*, Robert Russett and Cecile Starr (Ed.s), 1976, N.Y.: Van Nostrand Reinhold, p. 117.

[23] Norman McLaren, "The Low Budget and Experimental Film," *Experimental Animation: An Illustrated Anthology*, Robert Russett and Cecile Starr (Ed.s), 1976, N.Y.: Van Nostrand Reinhold, p. 118.

Lye undertook many investigations into the most appropriate paint to apply to the film strip. He finally settled on using lacquer paint as it shrinks at the same rate as film stock, especially when subjected to heat and stays stuck to the surface of the celluloid. Lacquer paint has, in addition, translucent properties that are essential to the visual aesthetic of *A Colour Box*. Aside from allowing sufficient light from the projector to shine through the film stock to register the intricate colour figures, it also allows Lye to layer visual images to create complex visual polyrhythms corresponding to those present in the musical accompaniment.

In contrast to visual music filmmakers like Fischinger, who often uses musical composition as an inspirational jumping off point, Lye has stated that he thinks of sound as something technical, generally seeking a musical piece that will conform to the visual rhythm that he has already conceived:

> First of all, the film is visual for me then I search around until I get a sound with the same kind of tempo or rhythm that I want. The resonance, you know. Then I spot it up to get the length of the notes and the particular accents that I want it to follow, that appeal to me. Then I synchronise that sound accent with the visual accent.[24]

In spite of this approach, there is little difference between Lye's physical methods of creating audio-visual correspondences and those of McLaren and Fischinger, who also graph the dynamics and accents of music in order to marry the music and picture. Moreover, Lye asserts that his films look terrible without sound because they are "done for sound, with sound."[25] This is especially apparent in *A Colour Box*. Although the film holds up without music due to the inherent musicality of the image matrix, it loses something on being played back silently as the picture was created in response to a specific musical track.

As I mentioned above, Lye frequently used a pre-recorded piece of music that conformed to a visual rhythm that Lye had already conceived, therefore, there is a loose association between the music and images in *A Colour Box*. Lye creates audiovisual relationships by linking musical and visual accents but at times he also finds an image to match a sound, such as the stringy images that correspond to the string sound of the guitar and the circle patterns that correspond to the percussive beat of the conga drum.

The images in *A Colour Box* follow the rhythm of the music in various ways, pulsating circles, squiggly lines that bend and vibrate in response to the trumpet melodies and wavy lines all superimposed over each other in addition to semi-translucent coloured backgrounds. The synchronisation of visual accents with the accents present in the music

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[24] Lye, *op. cit.*, p. 67-68.
[25] *ibid.*, p. 68.

make for a tight binding together of sound and rhythms with visual imagery. Lye not only builds up layers of colour and texture by painting directly onto the film strip but also complex lines of movement and rhythm. The abstract shapes seem to be dancing to the Cuban music.

The music has been edited and cannot be read purely in terms of Cuban jazz music. There are however three distinct musical sections and corresponding visual themes that are repeated in the course of the film. The first is a series of layered circle patterns, the second is a foregrounded undulating vertical line and the third is a more diffuse series of superimpositions.

A Colour Box uses distinctive rhythms drawn from the fusion of Jazz and Cuban characteristics present in the music. The music is in 4/4 common time but the percussive rhythm of the conga is based on a *clave* pattern, which functions as a type of rhythmic motif or ostinato.[26] The clave rhythm is characteristic of Cuban music and consists of a two bar rhythm, with one bar containing three notes and the other bar containing two notes. The melody of the composition will dictate which order this will occur in. In the case of *A Colour Box*, the conga is playing a clave that is visually matched by geometrically arranged circular patterns that move to the beat of the conga.

The intense percussion gives way to a second distinct section marked by the presence of a squiggly line that bends and undulates to the movement and rhythm of the foregrounded melodic line of the trumpet. This melody is underscored by support from the rest of Baretto's ensemble and this is reflected in the visual layers moving under the squiggly line. There is no exact correlation between the number of lines that appear on screen and the melodic line or musical intensity, with more than one line appearing on screen at once. The quivering of the lines does match the vibrato of the trumpet. As the music has an influence derived from jazz music, there is an element of improvisation present in the music that Lye artfully reproduces in the visual via his process of hand-painting. This approach allows him to catch the subtle nuances of the trumpeter's improvisational style by allowing him to respond to the unexpected changes in melody on a frame-by-frame basis.

Following on from the main trumpet theme, the film engages in a call-and-response section, again drawn from jazz music. The call of the main trumpet melody is responded to by a Spanish guitar punctuated with a steady percussion before the trumpet/squiggly line

[26] The Oxford Dictionary of Music defines an ostinato as a "term used to refer to the repetition of a musical pattern many times in succession while other musical elements are generally changing." Laure Schnapper, "Ostinato," *Grove Music Online*. Oxford Music Online, http://www.oxfordmusiconline.com/subscriber/article/grove/music/20547, [Accessed: January 28th 2011].

melody returns. There is a change in the visual aesthetic in response to the change in melody. The response section has a less defined and privileged melody and in the same fashion the visual images are more diffuse and overlaid with no single figure favoured over the other.

Lye is often working with more than one rhythm at once in *A Colour Box*. In the main percussive section there are in fact two rhythms being played out at once and this is reflected in the superimpositions that Lye creates by painting on both sides of the film strip. Lye manages to create two complex visual rhythms on screen at the same time. At the time of the film's creation there was no way that this could have been achieved by any animation process other than hand-painting directly onto film. In addition to the vertical movement that you would expect from somebody painting lengthwise on the film strip, there is an additional horizontal movement suggesting a dance that is occurring off screen. It is as though the shapes are Latin dancers circumnavigating a dance floor, drifting into frame and shimmying back out again.

It is not difficult to see why *A Colour Box* became so popular at the period of its creation and enjoyed a widespread theatrical release. In the first instance it was a colour film, which in itself was a novelty. In the second it was dynamic, vibrant and visceral, appealing to audiences on a direct primal level. Further to this, the music that Lye used was rhythmic, dancelike and popularly accessible with beating circles mirroring the beating percussion of the music and wiggling lines reflecting the wavering of the jazzy trumpet melody.

BEGONE DULL CARE (1949)

As I previously mentioned, McLaren used two basic techniques for the creation of his animation. One entailed painting images frame-by-frame and the other consisted of ignoring the frame line completely. McLaren's film *Begone Dull Care*, made in 1949, has the illusion of being almost totally frameless. It is a riot of intense colour and texture moving rhythmically to the music of Canadian jazz pianist Oscar Peterson. By ignoring frame lines McLaren manages to infuse the images with the frenetic energy of Peterson's composition.

Begone Dull Care is in contrast to many hand-painted visual music films, which often use the surface of the emulsion as a substitute for paint canvas. The layers of colour and texture lend an incredible depth to the imagery of the film. One example of this is when a silhouette of a bird appears to be struggling against the force of a vortex of earthy

brush strokes. Another example of this is the etched white lines that appear in the final third of the film seemingly dancing frenziedly into the distance before remerging to take centre stage in the foreground of the frame.

McLaren has said of his animation:

> I have tried to preserve in my relationship to the film, the same closeness and intimacy that exists between a painter and his canvas… and so my militant philosophy is this: to make with a brush on canvas is a simple and direct delight – to make with a movie should be the same.[27]

Even though McLaren began to create cameraless animations independently he was, as I highlighted earlier, highly influenced by Len Lye's cameraless visual music animations, in particular *A Colour Box*, and this is reflected in *Begone Dull Care*. There are obvious similarities with Lye's approach to capturing the nuances of improvisation and the unique rhythms of jazz such as painting vertically down the filmstrip without recourse to frame boundaries and the use of abstract shapes and movements. Where the two films differ however is in their use of music. Lye devised much of the visual imagery and rhythm for *A Colour Box* first before finding an appropriate musical accompaniment that would reinforce the mood and rhythm that he desired in the film. *Begone Dull Care*, on the other hand, has a far more nuanced relationship between the music and images. It was the result of collaboration with renowned Canadian Jazz virtuoso Oscar Peterson. *Begone Dull Care* is one of McLaren's most discussed films, particularly in relation to its jazz soundtrack so rather than dwell exclusively on the relationship of the film to jazz music as authors such as Terence Dobson and Paul Melançon have done, I will concentrate on formulating an explanation as to why the technique of drawing directly onto film stock is the most appropriate method for capturing the idiosyncrasies and structure of jazz music.[28]

In her book *Norman McLaren, Manipulator of Movement,* Valerie T. Richards writes that McLaren and Peterson worked together to produce the score. Peterson would play musical variations that allowed McLaren to begin to visualise the images and at other times McLaren would specify the music that he required in order to create a particular effect.[29] Upon hearing a record by Peterson that he particularly liked McLaren went to hear him play in a club in Montreal and told him that he wanted to make an abstract film to his music. McLaren showed Peterson *Dots, Loops* and *Stars and Stripes* and Peterson

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[27] Norman McLaren quoted in William E. Jordan, "Norman McLaren: His Career and Techniques," *The Quarterly of Film Radio and Television*, Vol. 8, No. 1 (autumn, 1953), Berkley: University of California Press, p. 10.

[28] See Terence Dobson, *The Film Work of Norman McLaren*, 2006, Eastleigh: John Libbey Publishing and Paul Melançon, "Begone Dull Care," *Senses of Cinema*, http://archive.sensesofcinema.com/contents/cteq/05/35/begone_dull_care.html.

[29] Valerie T. Richards, *Norman McLaren, Manipulator of Movement*, 1992, Delaware: University of Delaware Press, p. 70.

replied that the understood what McLaren was talking about. They decided to work together immediately:

> So we went back to the club, which is empty during the day time, and laid down the broad lines of his work. I knew what I wanted, so many seconds for the title, and three parts of which the first was to be medium fast, the second very slow and the third very fast. Since I did not want to use any known theme, on which there would be royalties to pay, Oscar improvised a few tunes for me.[30]

Peterson improvised some tunes and McLaren chose one to develop.

> I started making suggestions because some of the things he was doing gave me ideas. There were stretches where it was too hectic for too long a time. The eye would be tired with a fast movement so I said "Calm that down. Make it slow for this part or that part." And he'd do it. He'd give me half a dozen slow sections. So we shaped it, building up crescendos here and making the music thin there, cutting out the piano here and just having drums there.[31]

This continued for four days and McLaren was excited and pleased by the result stating:

> I was very happy because I felt not only had he given me pictures and images to create a movement, but he'd left me leeway to be free to do anything. He'd have a passage where I could treat it this way or that way or any other way.[32]

As I noted earlier in this chapter, one of the methods associated with direct animation is the disregard for formal frame boundaries. McLaren exploits this approach to its full potential in *Begone Dull Care* by painting and etching in solid downward lines. As a result of this approach, the kinetic movement in *Begone Dull Care*, rather unusually for an animation, happens predominantly vertically rather than horizontally. Musicians often think of musical shape unfolding horizontally as they are often accustomed to reading a musical score from left to right or thinking about music unfolding horizontally over time like an abstract time-line. Likewise many visual music animations can seem like that through the use of frame lines. McLaren's use of vertical motion implies a sense of unbridled motion with images and music that are too dynamic to remain constrained within the box of the frame. The images manage to escape horizontal expectations and dance alongside the Oscar Peterson trio's frenetic jazz musings.

Begone Dull Care is like watching a jazz improvisation unfolding. The imagery in the film does not repeat itself and is like watching the stream of McLaren's unconsciousness unfolding on screen. In spite of this quality of improvisation there is still a discernible three act structure in both Peterson's musical composition and McLaren's animation. Each of these movements has its own particular nuances and qualities. The

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[30] Norman McLaren, Interview, *Norman McLaren, Exhibition and Films*, 1977, Edinburgh: Scottish Arts Council, p. 24.

[31] Norman McLaren cited in Terence Dobson *op. cit*., p. 202.

[32] *ibid.*

film is composed of three discrete movements that through the organic hand-painted approach manage to coalesce into a homogenous whole. McLaren used the sonata ABA form in order to impose discipline on the free improvisation of the music.

> Many years ago I was confronted with a problem regarding abstract film visuals. It is relatively easy to make a one or two minute abstract film that will hang together and be a unity. But with an eight or ten minute abstraction, it is much more difficult. One runs the risk of creating either too much monotony, or too much diversity. Some kind of format or structure seemed necessary to vary the uniformity or to discipline the variety. I found that some of the forms which music has evolved (to solve the same problem) lent themselves to abstract visuals. I used the ABA form of classical music in *Begone Dull Care* and *Spheres*, and a short rondo-like form in *Short and Suite*.[33]

This use of a long established musical form had cognitive connotations and allowed McLaren to impress a pattern on it that the brain can make sense of. Philip Ball posits that composers such as Mozart and Bach subconsciously followed musical forms such as sonata form that could easily be made sense of by the brain.[34] One of the reasons that classical music and pop songs are so popular and pleasing to listen to is due to the predictable nature of their structure, for instance the typical verse-chorus form of most pop songs. Jazz music and avant-garde classical music such as the atonal music of Schoenberg, on the contrary, is unfamiliar and in the case of jazz improvisation highly unpredictable. The brain has to work to anticipate what is coming next. This means that even though classical compositions by composers such as Mozart and Bach can contain the same complexity of material as that found in a jazz composition, it is easier to take in due to being enclosed within a familiar structure.

Peterson had a firm training in classical piano, particularly in the etudes of J.S. Bach, encouraging his students at York University to study them, so theoretically it should not have been a stretch for him to temper his musical composition to sonata form. Furthermore, jazz has much in common with the contrasting forms of Baroque music, as exemplified by Bach, in addition to both having their own version of figured bass. However, it has been suggested that Peterson's improvisational techniques "lacked coherence" and were too complex for some listeners to process.[35] This view is reflected in McLaren's recollections of when Peterson went to Montreal to record the music for *Begone Dull Care*. McLaren and Peterson had spent four days shaping the music into a form that McLaren could animate to, however when the time came to lay the track down

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[33] Norman McLaren, Interview, *Norman McLaren, Exhibition and Films*, *op. cit.*, p. 25.

[34] Philip Ball, *The Music Instinct: How Music Works and Why We Can't Do Without It*, 2010, Oxford: Oxford University Press.

[35] Richard Severo, "Oscar Peterson, 82, Jazz's Piano Virtuoso, Dies," *New York Times*, December 25, 2007, http://www.nytimes.com/2007/12/25/arts/25peterson.html?_r=1.

McLaren recognised almost nothing of the original due to Peterson's constant improvisation. Each time that they rehearsed Peterson improvised something new. McLaren and Peterson had to spend the first hour trying to get the music back into its original shape while retaining the new good things that he had improvised.[36] It is to McLaren's credit that, in the case of *Begone Dull Care* he has managed to marry the stimulation, kineticism and unpredictability of Peterson's jazz improvisation with a familiar musical form that makes the film more accessible to a wider audience.

It has been established that McLaren had intended to use sonata form before beginning the film and described the division of movements thus; the first was to be a fast allegro movement, the second a slow molto andante movement and the final movement was to be a very fast prestissimo.[37] McLaren worked on the film in four or five second segments before checking whether or not he and assistant Evelyn Lambert had captured the "spirit of the music."[38] If the combination of the music and images did not work they would repaint the images. McLaren describes this manner of working as "a good example of the cooperation, the give and take, between the composer and the person who's doing the picture."[39] This approach means that they do not try to find a visual equivalence for every note allowing scope for improvisation within the visual imagery. This would have been too difficult to achieve with Peterson's complex syncopated soundtrack. The energetic visuals function like an additional track in the audiovisual score, adding a layer of visual instrumentation to the finished composition.

In spite of McLaren's attempts at imposing a familiar structure on the film, on initial watching *Begone Dull Care* can, nonetheless, be perceptually overwhelming, appearing as a kinetic ode to improvisation. The constant movement combined with the dynamic syncopated soundtrack makes it difficult for the brain to know firstly, where to focus, and secondly, what to focus on. McLaren and indeed, Peterson, provide the audience with a way into the film by marrying a visual theme to specific instruments on the soundtrack.[40] [41] This is not unlike Lye's approach in *A Colour Box*, in which he wedded percussive instruments to beating circles and trumpet trills to undulating lines. In his appraisal of the film, Paul Melançon attempts a rudimentary but useful and accurate

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[36] McLaren cited in "Interview," in *Norman McLaren, Exhibition and Films, op. cit.*, p. 24.

[37] Presstissimo means *as fast as possible* or *very fast* in musical terms. David Fallows, "Presto," *Grove Music Online*. Oxford Music Online, http://www.oxfordmusiconline.com/subscriber/article/grove/music/22316, [Accessed: February 7th 2011].

[38] Norman McLaren cited in Terence Dobson, *op. cit.*, p. 207.

[39] McLaren cited in "Interview," in *Norman McLaren, Exhibition and Films, op. cit.*, p. 25.

[40] Melançon, *op. cit.*, refers to the openings section as a segment but I would consider the term *movement* to be more appropriate in this instance.

[41] *ibid.*

analysis of the audiovisual correspondences in the various movements by drawing attention to the equivalency of specific instruments to particular visual occurrences. For example, the general correspondence of the bass to the colour red and the occurrence of a set of three parallel lines, either vertical or horizontal, with Peterson's piano in the first movement.[42] The audiovisual relationship is more intricate than this. As Terence Dobson points out McLaren and Lambert are interpreting phrases in the music thereby aiding the comprehension of the sound and vision as a complete unit.[43] This approach is not an unusual one for the visual music animators. Lye, Fischinger and Smith have all used it in order to provide an effective audio-visual contract between the music and pictures, representing the rhythm and spirit of the music rather than an exact synaesthetic correspondence.

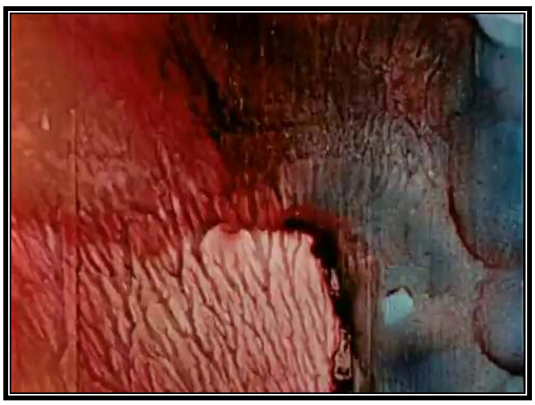

FIGURE 4.4: STILL IMAGE REPRESENTATIVE OF THE TYPE OF IMAGERY FOUND IN THE FIRST MOVEMENT OF NORMAN MCLAREN, *BEGONE DULL CARE* (1949), NORMAN MCLAREN: THE MASTER'S EDITION [DVD], 2006, CA: N.F.B.C.

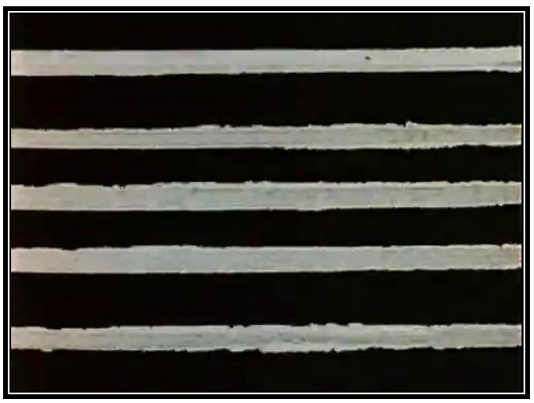

FIGURE 4.5: STILL IMAGE REPRESENTATIVE OF THE TYPE OF IMAGERY FOUND IN THE FIRST MOVEMENT OF MCLAREN, *BEGONE DULL CARE* (1949), *OP. CIT.*

The film begins with hand written title sequences in seven languages; an espousement of McLaren's universal intentions with the film. The descending piano melody perfectly matches the lines of the titles sequence as they appear one-by-one (see figure 4.4). The first movement opens with an eight beat musical and visual motif. Semi-translucent paint textures like stained cells under biological slides run vertically down the screen. This ends with eight beats sounded out on the piano. Silences in the piano are evinced by changes in the hue of the vertical stripes colour wash. As the drums march into the soundtrack they are met on screen with corresponding red shapes. The images wiggle, dance and vibrate in correspondence to the musical phrasing, gaining in intricacy and volume of imagery as the movement progresses. The piano is associated with white etches that look like water running down rocks or tree branches scratched into the black surface of the celluloid. Flashes of parallel lines, many arranged in groups of three like chord triads,

[42] Dobson, *op. cit.*, p. 202.
[43] *ibid.*, p. 203.

coincide with strongly accented piano chords (see figure 4.5). This motif returns several times during the first movement with variations.

The second major motif consists of translucent backgrounds overlaid with solid curved black shapes that gallop down the screen in time with the descending piano melody (see figure 4.6). The movement is vertical with freeform white etchings on black that correspond to the musical timing (see figure 4.7). There is a sense of perspective to these etchings with some of the cross-hatched lattices are tilted.

FIGURE 4.6: IMAGE FROM SECOND MOTIF OF MCLAREN, *BEGONE DULL CARE* (1949), *OP. CIT.*

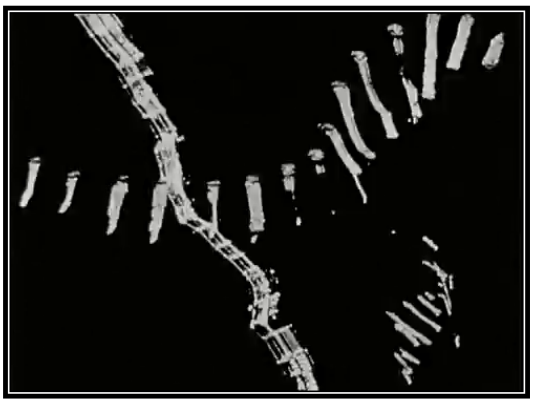

FIGURE 4.7: IMAGE FROM SECOND MOTIF OF MCLAREN, *BEGONE DULL CARE* (1949), *OP. CIT.*

A third motif consists of an alternation between fast arpeggio chords with shapes appearing and disappearing in synchronisation and freeform vamps on melodic lines (see figure 4.8). This motif alternates heavily with a fourth motif consisting of a musical melody, which is accompanied by freeform etchings, some figurative, others fused together and some look like stylised sound waves and saw tooth waves (see figure 4.9). McLaren and Peterson play around with these motifs, creating improvised variations and constantly restating them.

FIGURE 4.8: IMAGE FROM THE THIRD MOTIF OF MCLAREN, *BEGONE DULL CARE* (1949), *OP. CIT.*

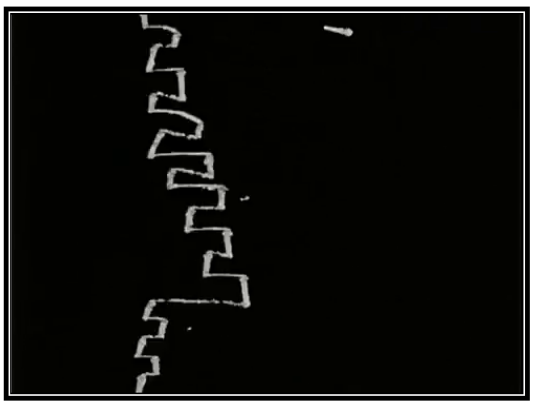

FIGURE 4.9: IMAGE FROM THE THIRD MOTIF OF MCLAREN, *BEGONE DULL CARE* (1949), *OP. CIT.*

The second movement, as is typical of second movements in a sonata, contrasts strongly with the preceding movement. Ominous low piano notes sound over a black screen. White scratches appear in synchronisation with piano notes before receding in

response to the decaying notes. The piano notes, underscored by brushed drum strokes, sound as though they are swinging in the same fashion as the scratches moving pendulously on screen. As this ominous swinging piano is succeeded by a sweet melancholic piano melody, white dots fly around screen, sometimes flaring out vertically. This dance continues with variations throughout the movement with the line becoming more numerous towards the end of the movement, vibrating to the sustain of the piano strings (see figure 4.10 and figure 4.11).

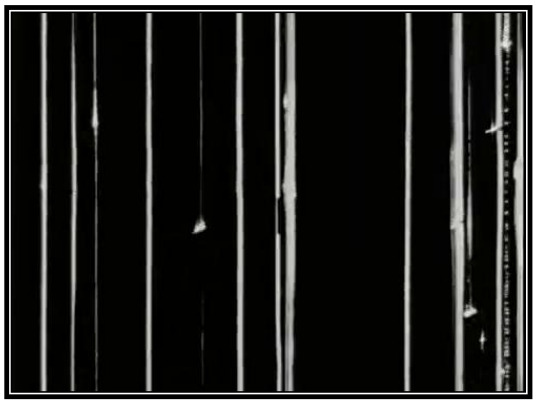

FIGURE 4.10: STILL IMAGE FROM THE SECOND MOVEMENT OF MCLAREN, *BEGONE DULL CARE* (1949), *OP. CIT.*

FIGURE 4.11: STILL IMAGE FROM THE SECOND MOVEMENT OF MCLAREN, *BEGONE DULL CARE* (1949), *OP. CIT.*

The third and final prestissimo movement of the film uses a *boogie woogie* piano in 4/4 time based on the twelve bar blues. This style of piano playing is underscored by a figured bass played by the left hand. McLaren superimposes constantly dancing dappled and scratched layers that are in constant flux. The figured bass is represented by stippled backgrounds that are in a state of constant unrest broken up with other variegated strips and colours coming and going. The punctuated action of stippling is arguably the best method for capturing the repetitive rhythm of the figured bass. At times the screen is split in two with white and black dot pictures trying to push each other out of frame. This functions as a visual metaphor for the figured bass and the melody fighting each other in a contrapuntal dual.

As this movement progresses McLaren, echoing the changing shape of the music, begins to introduce horizontal movement into the vertical bands and lines of the visuals by animating them to swing across screen. The swinging movement gets wilder and wilder with the visual stippling splitting to reveal a strip of clear film with three painted lines appearing (see figure 4.12). Different painted shapes in constant motion appear on this moving band of white. Variegations move in response to Peterson's vamps around single piano notes. Vertical stripes that range in colour and sway to the rhythm of the music shake and become increasingly erratic as the music repeats the same figure unable to move on while Peterson strikes discordant chords with his left hand (see figure 4.13).

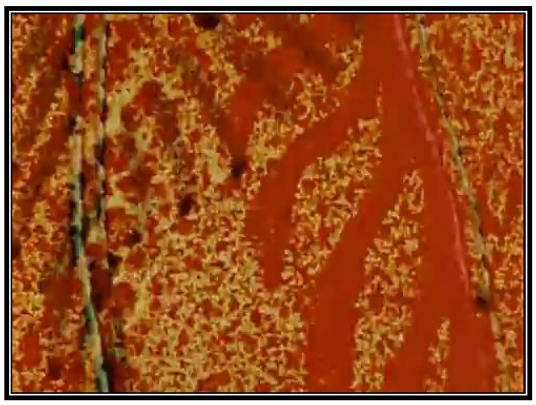

FIGURE 4.12: STIPPLED IMAGE FROM THE THIRD MOVEMENT OF MCLAREN, *BEGONE DULL CARE* (1949), *OP. CIT.*

FIGURE 4.13: STILL IMAGE FROM THE THIRD MOVEMENT OF MCLAREN, *BEGONE DULL CARE* (1949), *OP. CIT.*

McLaren introduces diagonal coloured bands that move from corner to corner. As one line moves across screen, horizontal lines and other shapes emerge from it whenever notes are played on the piano, the shapes representing the existence and duration of the notes. In one section one white line appears to be jumping over another as it disappears and appears in response to when the music appears and disappears on the soundtrack. Sometimes these lines extend outwards as multiple notes are held.

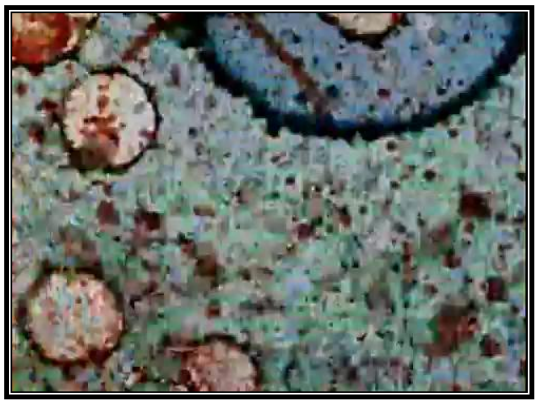

FIGURE 4.14: STILL FROM THE THIRD MOVEMENT FROM MCLAREN, *BEGONE DULL CARE* (1949), *OP. CIT.*

FIGURE 4.15: STILL FROM THE THIRD MOVEMENT FROM MCLAREN, *BEGONE DULL CARE* (1949), *OP. CIT.*

Painted coloured lines, dots and dashes appear on a neutral coloured background. Certain images such as stippled dots and translucent layers return turning the entire film into an expressionist watercolour with broad brush strokes overlaying colour washes (see figure 4.14 and figure 4.15). It is no great stretch to see why the appearance of this film has been compared to Jackson Pollock's drip paintings (see figure 4.16). This film rushes through this constantly shifting expressionist canvas throwing aside themes and images that were first met in the first movement; the primitive germ forms, the etchings, the stippled dots before coalescing into a co-ordinated ending in which "The End" etched in various languages, appearing one by one with musical notes, thus restoring order to the film.

FIGURE 4.16: JACKSON POLLOCK, *UNTITLED* (GREEN SILVER) (C. 1949), SOLOMON R. GUGGENHEIM MUSEUM, NEW YORK. UNTITLED WAS PAINTED APPROXIMATELY THE SAME YEAR THAT MCLAREN MADE *BEGONE DULL CARE*. HTTP://WWW.NGV.VIC.GOV.AU/GUGGENHEIM/EDUCATION/01.HTML

Rhythm is one of the identifying traits of jazz. The melodic lines of *Begone Dull Care* are underlined with a constant rhythmic pulse to it. This pulse is visually represented principally by the washed coloured backgrounds that McLaren draws over. The rhythm of *Begone Dull Care* is syncopated, creating rhythmic surprise through the placement of accents that fall between the beats. *Begone Dull Care* uses both the principles of syncopation and swing in opposition and conjunction to each other. The syncopation helps to create an element of surprise, while the swing helps to create a sense of forward motion. In the moments of syncopation the appearance and movement of the accompanying images that are overlaid over the pulse making backgrounds is synchronised to the accent of the rhythm specifically created by Peterson's piano. The use of swing creates forward momentum. In *Begone Dull Care* the swing generally lasts eight notes with the first part of each beat lasting longer than the second. McLaren captures the use of swing in the music through his use of vertical lines that *swing* across the screen in synchronisation with the musical phrasing. McLaren method of painting directly through the frame lines is the most effective method for capturing the fluidity of the swing. Attempts to paint or animate the swing frame-by-frame would undoubtedly have led to a stilted image that failed to capture the forward thrust of Peterson's music.

Another characteristic that jazz music shares with Baroque music is its use of counterpoint. This is particularly evident in *Begone Dull Care*. It has already been demonstrated that both Eggeling and Richter used counterpoint to structure their visual music films. In the case of *Begone Dull Care* McLaren is employing counterpoint in a different manner. While Richter and Eggeling use counterpoint to co-ordinate the

movement of geometric images in a simple *point-to-point* fashion, McLaren is using it in the complex manner espoused in jazz. In jazz music counterpoint is created when several instruments are playing separate melodic lines simultaneously with each carrying a different rhythm. In *Begone Dull Care* McLaren is using the visuals as an additional instrument functioning as an additional melodic line in counterpoint to Peterson's musical composition.

In an article for the *Canadian Forum*, written in 1950, Director of the National Film Board of Canada Guy Glover asserts:

> The visual part of *Begone Dull Care* does to your eye what the musical part does to your ear. It has no story – but its form has the beauty and significance of a musical composition and as such it should be enjoyed.[44]

OPTICAL SOUND

This thesis has thus far established that over the centuries there have been many attempts by artists, musicians and filmmakers to represent sound visually. The visual music filmmakers in particular were pre-occupied with finding new and innovative strategies for the translation of sound to screen. These strategies often relied on expressionistic, synaesthetic, rhythmic or harmonic translations. This section will focus on filmmakers Norman McLaren and Guy Sherwin's attempt to create one to one audio-visual correspondences on screen by literally translating the optical soundtrack into the visual images that are seen on screen.

ANIMATED SOUND TECHNIQUES

In the early years of cinema there was no physical capacity for creating a married soundtrack of image and sound material. Typically the silent films that were produced were accompanied by musicians who provided live music and sound effects as the film was being projected. This, of course, posed many problems to the visual music filmmakers such as poor performance quality, inappropriate music and a difficulty synchronising sound to the visual image. Some of the early visual music filmmakers sought to circumvent this. Eggeling explicitly instructed that *Symphonie Diagonale* be screened silently so that there was no distraction from his orchestration of visual images and Walter Ruttmann commissioned a tightly synchronised score from composer Max Butting for *Lichtspiel Opus 1*. Indeed, Ruttmann himself played the cello in the initial live

[44] Guy Glover, "Norman McLaren," *The Canadian Forum*, July 1950, p. 81.

performances of the musically accompanied film. The problems that arose from the lack of quality synchronised sound led to the development of a studio based recording system for marrying recordings of music, and sound effects with the projected picture. This was demonstrated in early *talking* picture *The Jazz Singer* in 1927 even though technically it is only the musical sequences that were recorded and the dialogue was still conveyed through the use of inter-title cards. It was still nonetheless a major breakthrough in the history of synchronised sound. The technique of sound and picture synchronisation used in the *The Jazz Singer* was eventually surpassed when in 1929 a method was developed for recording sound and image side-by-side on film.

Under this method, the sound film strip is composed of two married tracks – the optical track, which when printed is divided into a series of frames, and the sound track. Sound is recorded onto the soundtrack through a series of black and white patterns. Inside a film projector, the soundtrack is passed between a light source and a photoelectric cell. As it moves through the projector the black and white sound patterns recorded on it cause the amount of light striking the photoelectric cell to fluctuate rapidly. This illumination causes the photoelectric cell to generate energy. The sounds recorded on film are then converted to electrical impulses which can be made audible by means of an amplifier and loudspeaker.

Richard S. James writes that film music innovators soon discovered a number of unexpected and intriguing secondary benefits to this sound-on-film technology.

1. They could freeze and visually preserve a sound in pictorial form that could be manipulated and altered to create new sounds and sound arrangements.
2. Individual sounds or entire pieces could be easily edited and reordered.
3. Sounds could be altered by adding marks to the soundtrack by hand.
4. The recording process could be entirely circumvented by drawing or scratching directly onto the soundtrack by hand.
5. Pictures of various patterns could be combined like an animation sequence.[45]

Two basic types of optical sound recording emerged in relation to the visual music film; montage of sound or music or animated sound.

The first technique of sound montage was explored by Walter Ruttmann, who, on abandoning the animated visual music film after *Lichtspiel Opus 4*, made the first significant attempt at sound-on-film montage in his 15 minute sound film *Wochenende* (Weekend) in 1928. Commissioned by the Berlin Broadcasting System and completely

[45] Richard S. James, "Avant-Garde Sound-on-Film Techniques and Their Relationship to Electro-Acoustic Music," *The Music Quarterly*, Vol. 72, No. 1, 1986, p. 74-89.

devoid of visual images, *Wochenende* depicts a weekend holiday through a soundscape of found sounds that were recorded onto a film soundtrack to be projected in a cinema environment on a film sound projector. Although this filmic composition is devoid of pictures Ruttmann maintained that it *was* an experimental film with sound only and no images. This technique of sound montage also became the basis of *musique concrète*. As Ruttmann states in his 1929 manifesto, "Everything audible in the world becomes material."[46]

SOUND ANIMATION

The second sound technique associated with the film soundtrack to emerge in late twenties and early thirties was sound animation. Sound animation differs from sound montage as, unlike sound montage which relies on the manipulation of sound that has already been recorded onto film, it is created by actually drawing, photographing or scratching the sound directly onto the film. Interest in this technique was piqued from 1930 onwards by music theorists and artists such as Arseni M. Avraamov, Laszlo Moholy-Nagy and engineer Rudolf Pfenninger but for the purposes of this thesis I am concentrating on the visual music animators who adapted this technique for the express intention of creating visual music.

Bauhaus polymath Lazlo Moholy-Nagy was one of the first people to argue for a new form of sound that was one of production, rather than reproduction. In his 1922 article "Production-Reproduction" for the journal *De Stijl* Moholy-Nagy argued that that in relation to the acoustic realm, the gramophone must be transformed from an artefact that was a means of reproducing sound to one that was capable of producing new sounds just as new electronic instruments such as the Theremin[47] were at the time of writing.[48] Moholy-Nagy anticipated Rudolf Pfenninger in Germany by proposing that a scientific study of the sound patterns inscribed in the grooves of phonographic cylinder be undertaken to discover the "formal logic"[49] of the acoustic so that they could be mastered and reproduced as

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[46] Walter Ruttmann cited in "Soundings Programme" by Joseph Anderson. http://www.music.ed.ac.uk/soundings/2009-10-progs/Soundings-Nov-0910-Sat-6pm-full.pdf, p. 4.

[47] The Theremin or Thereminavox was an electroacoustic instrument invented by Russian scientist Leon Theremin in 1920. It is unusual in its conception as it does not require physical contact on the part of the player to produce music. The performer controls pitch and volume by manipulating their hands in proximity to two antennas.

[48] László Moholy-Nagy, "Production—Reproduction," *Moholy-Nagy*, Krisztina Passuth (Ed.), 1985, London: Thames and Hudson, p. 289–290.

[49] Thomas Y. Levin, "Tones from Out of Nowhere," *New Media, Old Media: A History and Theory Reader*, (Eds.), Wendy Hui Kyong Chun and Thomas Keenan, Routledge, p. 45.

"acoustic writing"[50] to liberate the gramophone from its function of reproducing sound to an "over all instrument which supersedes all instruments used so far."[51] Composers would instead write sound directly into a form that could be played back without first writing a musical score.

Some composers such as Paul Hindemith took up Moholy-Nagy's call to arms but the gramophone did not prove to function as a successful instrument in the creation of a new form of music production. Moholy-Nagy subsequently realised that the optical film soundtrack would be a more fitting format for a new variety of music. Again Moholy-Nagy issued a challenge for the creation of a new synthetic sound form but this time he extended it to filmmakers, calling for "a true opto-acoustic synthesis in the sound film"[52] and predicted the emergence of an abstract sound film, such as those made by Ruttmann and McLaren in subsequent years, through his suggestion that the soundtrack be experimented upon in isolation from the image track.

> It will not be possible to develop the creative possibilities of the talking film to the full until the acoustic alphabet of sound writing will have been mastered. Or, in other words, until we can write acoustic sequences on the soundtrack without having to record any real sound. Once this is achieved the sound film composer will be able to create music from a counterpoint of unheard or even nonexistent sound values, merely by means of opto-acoustic notation.[53]

Rudolf Pfenninger produced the first comprehensive and functioning technique for the synthetic generation of sound in the early 1930s. While working as a film projectionist in Munich he simultaneously began to undertake experiments with synthetic sound. The most common legend that has grown up around the origins of Pfenninger's work tells that he began to create synthetic soundtracks out of economic necessity to provide a soundtrack for experimental animations that he was making.[54] He began to study oscilloscope patterns produced by specific sounds and eventually managed to isolate a "graphic signature"[55] for each tone. He subsequently drew the curve of this signature onto a strip of paper, which he then photographed onto the optical soundtrack and heard on playback under a selenium cell.

At the same time that Pfenninger was working on his sound-on-film techniques in Germany, similar research was being carried out in Russia. At the Scientific Experimental Film Institute in Leningrad, Avraamov, a musical theorist and mathematician collaborated with animators N.Y Zhelinsky and N.V. Voinov to create a frame-by-frame method that

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[50] *ibid,* p. 45.
[51] László Moholy-Nagy cited in Levin, *op. cit*., p. 45.
[52] *ibid.,* p. 48.
[53] *ibid.,* p. 45.
[54] Levin, *op. cit*., p. 53.
[55] *ibid.*

generated an animated soundtrack with a standard animation camera. Avraamov's soundtrack consisted of geometric figures such as ellipses, parabolas, triangles, rectangles and ovals. Pitch was controlled by moving the figures closer or further away from the camera or producing separate drawings for each pitch. Control over the volume was achieved by varying exposure times. Harmony and counterpoint was accomplished through the use of multiple exposures, by sub-dividing the soundtrack lengthways or through a rapid alteration of tones. Avraamov's aim was to create a new tonal system that would free music from the twelve tone scale that Western music was shackled to. Avraamov laid out his vision for an "ultrachromatic"[56] 48 tone scale system in his 1927 thesis "The Universal System of Tones." Prior to his work creating a graphic sound art he composed a precursor to musique concrète entitled a "Symphony of Factory Sirens" (1923). It was first performed at Baku in the Soviet Union and used navy ship sirens and whistles, bus and car horns, factory sirens, cannons, the foghorns of the entire Soviet flotilla in the Caspian Sea, artillery guns, machine guns, hydro-airplanes, and a specially designed whistle main. It also incorporated renditions of "Internationale" and "Marseillaise" by a mass band and choir. The piece was conducted by a team of conductors using flags and pistols.[57]

Following on from the work carried out by Avraamov and his collaborators, G.M. Rimski-Korsakov (the grandson of composer Nikolai Rimski-Korsakov) and E.A. Scholpo carried out more experiments on the synthetic soundtrack at the Leningrad Conservatory. In a similar fashion to Pfenninger, they undertook oscilloscope analysis of natural sounds and built music by assembling small units of film with separate tones into an edited whole. This approach was later echoed by British electronic composer Delia Derbyshire in her work with the BBC Radiophonic workshop. Derbyshire's most well-known piece of work is the 1963 theme tune for long-running British science-fiction program *Dr. Who*. Derbyshire re-created composer Ron Grainer's (vague) melodic outline by creating the notes using electronic sounds generated by oscillators. These electronic notes were subsequently recorded onto magnetic tapes that were edited into loops and were later combined into a single track.

Oskar Fischinger has generally been vaunted as the father of the animated soundtrack at the expense of Rudolf Pfenninger but Thomas Y. Levin speculates that news of Pfenninger's discoveries in relation to the synthetic soundtrack led Fischinger to explore

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[56] Marina Lobanova, "Avraamov, Arseny Mikhaylovich," *Grove Music Online*, Oxford Music Online, http://www.oxfordmusiconline.com/subscriber/article/grove/music/5271, [Accessed: April 13th 2010].

[57] "Symphony of the Factory Sirens Program Notes," http://sonification.eu/Avraamov, [Accessed: April 15th 2010].

ways of generating forms of sound rather than reproducing them through the animated soundtrack. In *Optical Poetry*, his biography of Fischinger, William Moritz draws attention to the fact that Fischinger suddenly abandoned his visual animation projects in 1932 in favour of experimenting with animated sound. This sudden embrace of synthetic sound could be attributed to his discovery of the work of Pfenninger through the cloud of publicity that surrounded his work at the time.

Throughout his animating career Oskar Fischinger maintained an interest in the correspondence between sound and visual image. His real "conceptual breakthrough,"[58] however came in spring 1932 when he realised that the designs for his abstract animations were not substantially different from the patterns generated by sounds on the optical soundtrack. Fischinger developed many strategies for finding the most efficient way of photographing sound and, once again, adapted technology to suit his ends by filing open the section of the camera aperture where the film soundtrack sat in order to film drawings directly onto the soundtrack. He began to study the patterns made by pre-recorded soundtracks and mastered the drawing of simple melodies from European folk songs. He quickly discovered problems with more complex melodies in relation to the edge of the film frame. Sound images had to overlap perfectly onto the next sound image in the adjoining frame in order to sound like discernible musical notes. This is something that would not have arisen in visual animation.

Even though Fischinger and Pfenninger were both attempting to create a form of synthetic sound at the same time, they were, in fact, pursing different agendas. Pfenninger's work was intrinsically rational and indifferent to the aesthetic possibilities that synthetic sound provided. He was more concerned with technical developments and was trying to create a new form of sound writing free from the constraints of existing institutions and notation, not unlike Eggeling and Richter's intentions with their *Universelle Sprache*. He used precise waveforms that functioned as templates for exact tones and could be reproduced by hand again and again. In addition his graphic templates were discrete elements. Levin writes that Pfenninger's approach challenged the "hegemony of certain tonal systems."[59] This is in part due to the fact that it was free from the restrictions of Western harmony and was micro-tonal in nature and was creating entirely new sounds, not imitating existing ones. It was, in addition, not pre-recorded but completely created without resort to instruments or performers and pre-figures modern electronic music.

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[58] Moritz, *Optical Poetry*, *op. cit.*, p. 42.
[59] Levin, *op. cit.*, p. 58.

Fischinger's intention, on the other hand, was to create a greater unity between picture and sound and, as Levin suggests, explore the relationship between graphic forms and their auditory counterparts.[60] Unlike Pfenninger, who was interested in discovering and studying what tones were produced by specific graphic shapes, Fischinger was concerned with discovering what sounds specific shapes produced. He took abstract sound and attempted to develop a way to codify the visual images in order to create a "visual calligraphy."[61] He was essentially producing and exploring sound from extant items. In terms of musical genres Fischinger was more closely aligned with the tradition of musique concrète that was to emerge under the guidance of Pierre Schaeffer in Paris during the 1950s.

Paul Seligmann, who was a member of *Das Neue Frankfurt* Cinema Club and was present at Moholy-Nagy's screenings of the work of both Fischinger and Pfenninger, writes:

> It is in the end Pfenninger, who discovered the path to acoustic writing. While Fischinger merely photographs sound as process, Pfenninger captures it as individual images, which led him to develop templates by means of which particular sounds and sound groups can be repeated at will.[62]

This is a remarkably prescient statement as Pfenninger's process would allow subsequent animators such as Norman McLaren to develop their own templates that produced identical tones to Pfenninger's. Essentially Pfenninger created a standardised form of acoustic writing that could be universally reproduced by other sound-on-film composers or visual music filmmakers.

ELECTRO-ACOUSTIC MUSIC

These techniques of sound montage and animated sound were not limited to the sphere of experimental animation but were also employed by experimental composers and the development of sound-on-film techniques has a parallel in the development of electro-acoustic music. The term *electro-acoustic* encompasses a body of Western art music that:

> sought to expand compositional resources beyond the sounds available from instruments and voices, to explore new sound shapes and timbres both by transforming recorded sources and by synthesising new sounds and to break the confines of fixed pitch and metrically based approaches to rhythm.[63]

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[60] *ibid.*
[61] Richard S. James, *op. cit.*
[62] Paul Seligmann cited in Levin, *op. cit.*, p. 59.
[63] Simon Emmerson and Denis Smalley, "Electro-acoustic music," *Grove Music Online*, Oxford Music Online, http://www.oxfordmusiconline.com/subscriber/article/grove/music/086957, [Accessed: April 13th 2010].

Rather than being a genre of music, electro-acoustic music is a manner of describing the technology responsible for the production of a body of electronically treated or produced music and encompasses varying developments in the realm of electronic art music such as *musique concrète* and *elektronische music*.

Musique Concrète was a term originated by Pierre Schaeffer in Paris in 1948 "to differentiate between music assembled from concrète sound objects and music based on the abstract medium of notation."[64] Inspired by film soundtracks and Schaeffer's work as a radio engineer, musique concrète refers to music that is assembled from recorded sounds, natural or man-made. Composers of musique concrète work directly with sound material as opposed to symbolic notation and the sound material could be taken from pre-existing recordings or recordings made especially. Initially the sounds were intended to remain in a raw form that was not electronically modified but over time composers began to treat the sounds. These sounds, treated or not, were structured through a process of experimentation. Schaeffer intended that "sounds should be perceived and appreciated for their abstract properties rather than being attached to meanings or narratives associated with their sources and causes."[65] In other words musique concrète could function in an absolute context just as music in the Western art tradition could function on an absolute level where the notes and tones carried the entire meaning of the music. This is not far removed from Fischinger's experiments with his *sounding ornaments*[66] drawn from graphic shapes, which like Schaeffer's *sound objects* became *acoustimised* or severed from their original source. When this occurs the listener can focus on the sounds as discrete abstract entities, appreciating the qualities of the sounds for their intrinsic worth.

The term *Elektronische music* was coined by German composers in Cologne in the fifties. It refers to music that was recorded on magnetic tape and created from sounds generated electronically from synthetic materials from machines such as oscillators and aimed to extend "control to the structure of sound itself."[67] It was envisaged that the musical structure would be determined before the electronic material was created. The philosophy behind this approach was, to a certain extent, taken up by Norman McLaren in his continued experiments into the creation of synthetic visual soundtracks.

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[64] "Musique Concrete," *The Oxford Dictionary of Music, 2nd Edn. Rev*., Michael Kennedy (Ed.), Oxford Music Online, http://www.oxfordmusiconline.com/subscriber/article/opr/t237/e7104, [Accessed: April 13th 2010].

[65] Emmerson and Smalley, *op. cit.*

[66] Oskar Fischinger, "Klingende Ornamente," *Deutsche Allgemeine Zeitung*, *Kraft Und Stoff*, No. 30, 28 July 1932, http://www.centerforvisualmusic.org/Fischinger/SoundOrnaments.htm, [Accessed: February 7th 2011].

[67] Emmerson and Smalley, *op. cit.*

SYNCHROMY (1971)

McLaren became exposed to the synthetic sound efforts of Pfenninger and Fischinger during screenings of their synthetic sound films at the Glasgow School of Art during his time studying there in the 1930s. His first experiments with synthetic animated sound began with scratches made arbitrarily onto the surface of the optical soundtrack during his time working for the GPO film unit in 1937 for his film *Book Bargain* (1937). McLaren continued to use this technique during his time in New York, mainly out of economic necessity. As he could not afford to pay for music rights to pre-recorded music or record his own he decided to draw and scratch his own soundtracks on films such as *Dots*, *Loops*, *Allegro* and *Rumba*, which consists only of a synthetic soundtrack without the accompaniment of visuals. These were created for the Guggenheim museum, which was known as The Museum of Non-Objective Art at the time, while under the reign of Baroness Hilla von Rebay, the mercurial champion of visual music in the early part of the twentieth century.

In the early forties McLaren developed a more systematic technique of creating animated soundtracks. Inspired by Pfenninger's method, he created a library of one inch by twelve inch strips with one to one hundred and twenty repetitions of hand-drawn sound wave patterns that could produce every semi-tone across a five octave range. This method was employed in films such as *Now is the Time* (1951), *Two Bagatelles* (1952), his Oscar winning blend of pixilation animation and lived-action, *Neighbours* (1952) and *Blinkity Blink* (1955). His 1971 film *Synchromy*, however, was to be the pinnacle of his exploration of the synthetic soundtrack.

With *Synchromy* McLaren was endeavouring to create a visual music film with an exact one-to-one correspondence between the visual and aural track. McLaren photographed the images that produce the individual musical notes onto the optical soundtrack. He then photographed this hand drawn soundtrack onto the visual track of the celluloid, thus ensuring that what we are seeing on screen is an equivalent relationship between the aural and visual track.

Due to the importance that is attached to the material of the film and the manner in which it is structured, it is imperative to disclose the methods that McLaren used to construct the film. McLaren began by composing the music first by filming musical tones frame-by-frame onto the soundtrack at the edge of the picture. He produced a set of 72 white cards with black stripe patterns that he referred to as "striations."[68] Each of these

[68] Norman McLaren, "Technical Notes on Synchromy," *op. cit*.

represented a semi-tone in a chromatic scale of six octaves. The number of striations on a card corresponded to the pitch of the note that is heard; the more stripes, the higher the note; the fewer stripes, the deeper the notes. The volume was controlled by varying the width of the soundtrack. McLaren used a moveable shutter to control the width. An almost closed shutter resulted in a narrow band of striations and produced a quiet pianissimo sound (see figure 4.17).[69] Conversely a wide open shutter result generated a broadband of stripes and a fortissimo sound (see figure 4.18).[70]

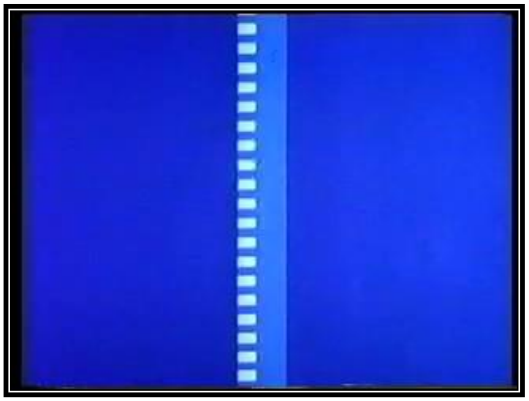

FIGURE 4.17: STILL FROM NORMAN MCLAREN, *SYNCHROMY* (1971), NORMAN MCLAREN: THE MASTER'S EDITION [DVD], 2006, CA: N.F.B.C. DEMONSTRATING A PIANISSIMO SOUND.

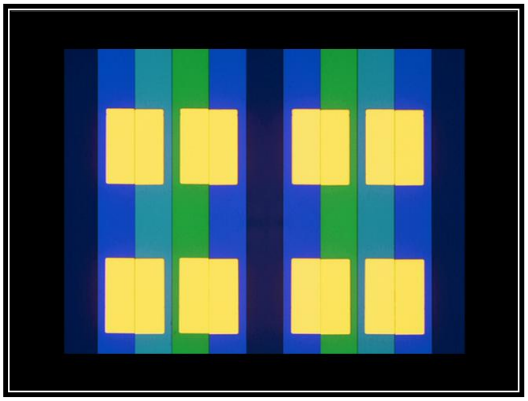

FIGURE 4.18: MCLAREN, *SYNCHROMY* (1971), *OP. CIT. DEMONSTRATING A FORTISSIMO SOUND.*

McLaren started with a single musical part that is over time joined by a second and subsequently a third part. These three parts create a simple polyphony with the first part corresponding to a mid-pitch, the second corresponding to a treble and the third corresponding to a bass. These three parts were recorded on separate strips of film that were rerecorded and mixed onto magnetic tape and subsequently onto the optical sound track. It might be useful to think of these three parts and their different tones as representing a simple choir with firsts (mid-pitch), descants (upper pitch), and seconds (lower pitch).

Synchromy differs from *Begone Dull Care* in its interpretation of audio-visual structure. As established earlier, *Begone Dull Care* was ostensibly an interpretation of the *spirit* of Oscar Peterson's jazz composition, *Synchromy*, on the other hand, attempts to demonstrate an almost exact correlation between the music and visual images. The visual manifestations of the music are closely synchronised.

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[69] Pianissimo is a musical term indicating that something must be played very quietly, "pianissimo," *The Oxford Companion to Music*, Alison Latham (Ed.), Oxford Music Online, http://www.oxfordmusiconline.com/subscriber/article/opr/t114/e5155, [Accessed: February 7th 2011].

[70] Fortissimo indicates that something should be played very loudly. "Fortissimo." *The Oxford Dictionary of Music*, 2nd ed. rev., Michael Kennedy (Ed.), Oxford Music Online, [Accessed: February 7th 2011].

The film has been referred to as being synaesthetically perfect.[71] However, there are certain deviations between what is photographed onto the soundtrack and what is presented on screen. Were McLaren to have created an exact replication of the soundtrack on screen, the images would have been single monochromatic bands with striations at the edge. McLaren introduces visual variations that no longer maintain an exact association between the sound and visual tracks. The most noticeable variation is McLaren's introduction of colour into the images. The complexity of the colour increases in relation to the changing complexity of the music. McLaren was not following a theory of colour-sound association. There is, nevertheless, a basic visible correlation between the tone of the colours that McLaren uses and the quality of the sound used. Notes that are pianissimo are presented in muted tones (see figure 4.19), while fortissimo notes are given vivid hues with high levels of contrast between shades (see figure 4.20). This correspondence could be said to be performing the equivalent of *musical colour.*

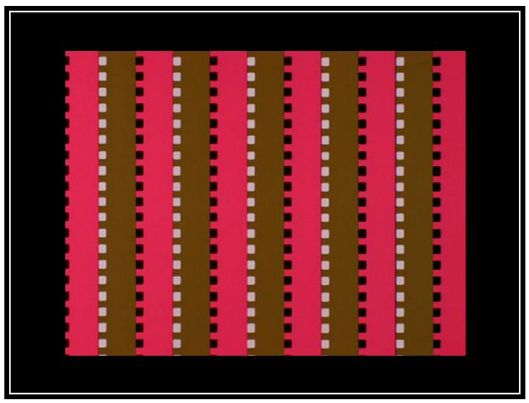

FIGURE 4.19: MCLAREN, *SYNCHROMY* (1971), *OP. CIT.* DEMONSTRATING THE MUTED TONES USED TO DENOTE PIANISSIMO.

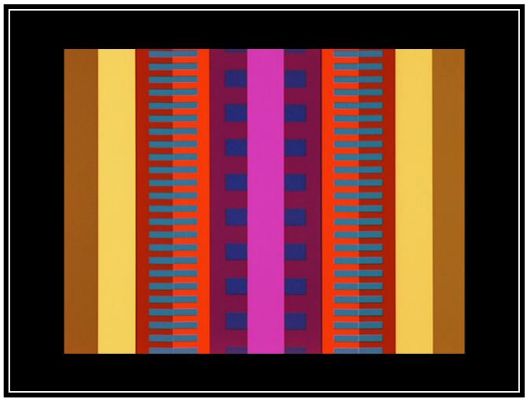

FIGURE 4.20: MCLAREN, *SYNCHROMY* (1971), *OP. CIT.* DEMONSTRATING THE VIVID TONES USED TO DENOTE FORTISSIMO SOUNDS.

Another obvious disparity between the two tracks is the quantity of material on screen. At times there are up to eleven bands repeated on screen while there is obviously only one equivalent band on the soundtrack. Therefore McLaren has printed multiple versions of the soundtrack onto the visual area of the film strip. It is difficult to know why McLaren did this. It could be to create a greater spectacle for the viewer to look at. A single narrow band could potentially be lost on screen as the area dedicated to the visual track is much greater than that of the optical soundtrack. This means that McLaren could potentially have been replicating the material in order to fill the screen. As with the colours, there exists a certain correlation between the number of bands that appear on screen and the complexity of the musical arrangement so another possibility is that McLaren was trying to emphasise the density of certain sections of the music.

[71] Dobson, *op. cit.,* p. 208.

Another divergence from exact equivalency is the movement of the band striations across the screen. This is particularly evident in the latter third of the film. The striations jump across bands changing colours as they move. Throughout the film these columns move, seemingly arbitrarily, to different sides of the screen so, although there is an exact parallel between the sound being heard and the image being seen on screen, there is no correlation as to auditory location. Panning does seem to occur however at particularly climatic moments in the soundtrack. McLaren asserts that this changing of column position was used merely to give "variety"[72] to the visuals. It certainly introduces a sense of dynamism and movement to the proceedings that could otherwise have been lost in the melee of formal primitive stripes. Terence Dobson posits that this lateral movement of the striations helps to unify complicated parts of the film but I do not think that this is necessarily true.[73] In fact I would suggest that it erodes the union between tracks further as it splits the striations of the sound image horizontally across the screen rather than allowing it to occur vertically on a single band as it does on the soundtrack.

Through his experiments with hand-written music McLaren developed two types of sound wave patterns that he used in his films with synthetic soundtracks. For example, in *Neighbours* (1952) McLaren used soft-edged swelling stripes that correspond roughly to non-sinusoidal saw-tooth sound waves. *Synchromy*, conversely, employs square wave cards formed from simple hard-edged black and white stripes that correspond acoustically to square sound waves. Square waves look like primitive sine waves due to their square appearance. They use comparatively few samples and produce a hollow sound, which means that they are often used to synthesise lower wind instruments in electronic music. It has equal high and low periods in its wave form. Saw-tooth waves, so called because they look like the sharp teeth of a saw, are used to synthesise string instruments such as the violin. By rounding off the edges of the saw-tooth waves McLaren was changing the shape of the sound waves and therefore the tone produced by the waves.[74]

Volume is visually represented by the size of striations on screen. The striations are generally smaller than the width of the bands on which they are placed on the left of the band. The striations get wider as the sound grows louder. Pitch in *Synchromy* is signified by the horizontal striations on the vertical bands. Narrow striations with little space between them represent higher pitched sounds, while lower pitched sounds are represented by broad striations. McLaren also uses spatial location to indicate the pitch of notes.

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[72] *ibid*., p. 211.
[73] *ibid*.
[74] For further information on wave forms please see "Chapter Ten: Classical Waveforms," Miller S. Puckette, *The Theory and Techniques of Electronic Music*, 2007, London: World Scientific Publishing, pp. 301 – 330.

Striations located towards the top of the screen represent notes of a higher pitch, while notes towards the bottom of the screen signify a lower pitch. This has parallels in musical notation, in which the position of notes on or between the lines of the stave designates the pitch of the notes.

The tones in *Synchromy* bear an uncanny similarity to those produced in *chiptune* or *8-Bit music*. Philip Phelps broadly categorises chiptune music as music that is produced by the sound chips in domestic computer and computer game systems that were predominantly manufactured in the 1980s and 1990s.[75] Domestic computer systems at this time used sound chips as additional processors in order to ease the workload of the CPU (centre processing unit). These sound chips were very primitive and could produce and control only a limited number of musical parameters such as waveform and pitch. This gives musical compositions that are produced by these hardware chips a distinctive electronic tone that is, sonically, almost identical to those present in *Synchromy*. The synthetic nature, tone and range of sounds produced by chiptune music make it a particularly apt point of comparison with McLaren's animated soundtrack.

The chiptune composers were often experienced computer programmers. McLaren is in essence both programmer and composer on *Synchromy*, using a similar mode of production to the producers of chiptune music. Typically a simple compositional tool called a tracker is used to program the music in real time note-by-note. McLaren developed his own method for *programming* his music through his system of card templates.

Phelps points out that tracker software contain "programming conventions" that can also be applied to music. He asserts that individual notes have equivalence with programming statements and that musical phrases have equivalence to blocks of programming code. McLaren has created his own "programming conventions" in *Synchromy*. The individual musical notes correspond to striations on vertical bands, while phrases correspond to the band themselves.

Although it is possible to program the individual parameters for each note individually, the software for the tracker allows the musician to create sequences unencumbered by the need to attend to the minutiae of every musical aspect. McLaren is doing something similar in *Synchromy*. While he could redraw and refocus individual notes, he created cards containing sequences of sound images that he could reuse throughout the film.

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[75] Philip Phelps, "A Modern Implementation of Chiptune Synthesis," University of the West of England thesis, http://www.zenpho.co.uk/PhillPhelps-ChiptuneSynth.pdf, p. 3.

Chiptune compositions have idiosyncratic sound characteristics that identify them as chiptune. They use waveforms with a low bit rate that create simple non-sinusoidal waveforms such as the square and sawtooth wave forms used by McLaren in *Synchromy* and *Neighbours*. Chiptune compositions are also characterised by rapid switching between waveforms in order to increase the complexity of waveforms and sounds. Further to this they often use extremely fast arpeggios to disguise the limited polyphony and create the illusion of chords.[76]

McLaren employs similar strategies to help him overcome the *programming* limitations of his *hardware*. For the most part McLaren utilises only a single note at any one time, avoiding the use of chords. He also uses a rapid alteration between notes to disguise the lack of chords or additional melodic lines. In addition, the duration of images on screen matches the duration of notes. McLaren has employed a staccato rhythm with discernible silences between notes/images. Unlike with the *Music Animation Machine*, in which the action unfolds horizontally, in *Synchromy* it takes place on a flat plane, therefore were McLaren to use a different rhythm there is a danger of the image on screen being static. The sharp staccato infuses the visuals with an energy that results in a flickering visual pulsation.

While *Synchromy* cannot be considered to be entirely successful as a synaesthetic film with a one-to-one equivalency of sound and image it is a laudable attempt. There is no indication that I have been able to find that McLaren was in fact aiming for an exact correspondence. Although McLaren was interested in seeing what his synthetically composed soundtrack looked like on screen he was always aware that he was creating films to be enjoyed by a wide audience. One can speculate that this is the reason that he introduced variations into the imagery of the film that had no physical basis in the sound. He was less concerned with the purity of process and asceticism that is present in the optical sound films of other filmmakers like Guy Sherwin. Sherwin, who was operating within a different cinematic context that was derived from structural/materialist film, was content to stick to his rigorous experiments in "aural/visual rhythm." The audience for Sherwin's optical sound films tended to be small, cine-literate and art-literate and he was not afraid to allow his audience to potentially be bored. This context allowed Sherwin a greater modicum of creative freedom than perhaps McLaren could allow himself due to his patronage by the National Film Board of Canada.

More interesting about *Synchromy* than its perceived attempt at one-to-one equivalency is how it fostered the idea of translating sound into images and images into

[76] *ibid*., p. 5.

sound by using the same raw material for each. This combined with the sharp electronic qualities of the electronic sound prefigured experiments of making exact transformations in the digital realm. A recent study led by neuroscientist Dr. Nina Kraus at the Auditory Neuroscience Laboratory based at Northwestern University demonstrated that the level of electrical activity in the brain when listening to music matches that of the physical properties of sound waves. Brain scans clearly demonstrated that brain waves recorded as subjects were listening to music could be converted back into sound. For example when Krause's team played back sound waves collected from subjects who had listened to the well known guitar riff from "Smoke on the Water" by Deep Purple, the resultant sound, although not identical to the original recording bore a discernible resemblance to it. This experiment demonstrates that sound and brain waves work at the same convertible frequencies.[77] In addition to this, light waves are also measureable in these frequencies so theoretically it is possible to translate these across the physical senses. In the previous chapter it was demonstrated that John Whitney and Jordan Belson had attempted to stimulate the impulses of the mind towards a state of mediation through rhythmic light and sound pulsations that were working on particular frequencies.

Although it is possible to create one-to-one translations through analogue methods, more accurate correlations can be achieved by the use of digital translations. Identical mathematical codes can be used across sensory barriers to achieve an exact equivalency as the next chapter will demonstrate through its consideration of on the computer films of John Whitney. In these terms what is most remarkable about *Synchromy* is what is portended and opened up in terms of audiovisual translation with the best methods available to McLaren at the time of production. The next section will further explore the expressive possibilities and materiality of the synthetic soundtrack through a consideration of Guy Sherwin's experiments with *optical sound*. While McLaren was occupied with Pfenninger's attempts at creating *acoustic hand* writing, Sherwin was pursuing an agenda closer to Fischinger's approach to creating synthetic sound.

[77] Daniel Peake, "Sound science: How music morphs the mind," *Medill Reports*, March 17th 2010, Chicago: Northwestern University, http://news.medill.northwestern.edu/chicago/news.aspx?id=162301, [Accessed: October 21st 2011].

GUY SHERWIN: OPTICAL SOUND FILMS

British filmmaker Guy Sherwin was involved in the production of synthetic soundtracks at roughly the same time that McLaren was working on *Synchromy*. Sherwin initially studied painting at Chelsea School of Art in the late 1960s. Highly influenced by structuralist films by filmmakers such as Peter Kubelka, he began to make films as part of the Film-Makers' Co-Operative during the mid-1970s. Sherwin has amassed a large body of work that looks at the physical materiality of film but the films relevant to this thesis are what he terms as *optical sound* film. These films explore the correspondence between sound and pictures. This section will look explicitly at his optical sound films of the 1970s, in which the musical track is also providing the material for the visual track. This approach has its roots in the type of sound experiments that Fischinger was carrying out in Germany in the 1930s.

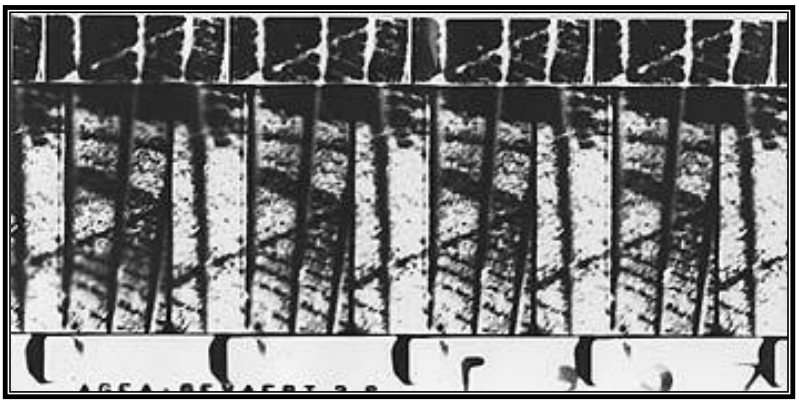

FIGURE 4.21: FRAMES FROM GUY SHERWIN, *RAILINGS* (1977). DEMONSTRATING IMAGES OF RAILINGS PRINTED ONTO THE IMAGE TRACK AND SOUNDTRACK. HTTP://WWW.LUXONLINE.ORG.UK/GALLERY_VIEWER/ARK_GV/IMAGE/843121/INDEX.HTML.

Sherwin asserts that these films have three discernible influences on them; structuralism, the idea of aural/visual equivalence and Steve Reich's musical experiments with sound phasing around the same period.

> Early on I got intrigued by the idea of 'optical sound' – the fact that you can create sound by visual means, and I tried to think through ideas of aural/visual equivalence. I made a loop of eleven image-moments against twelve sound-moments in order to see how the brain deals with this aural/visual slippage. This piece might have been influenced by Steve Reich's early sound phasing pieces, but I'm not sure. One certain influence was a film called Arnulf Rainer by the Austrian Peter Kubelka that consisted only of black or white frames and white noise or silence, composed into various rhythmic patterns. Overall my main influence was the work of the London Filmmakers Co-op, in particular the film performances of Malcolm LeGrice and Annabel Nicolson.[1]

[1] Guy Sherwin in "Guy Sherwin – Artist's Interview," 2008, London, Lux Moving Image, http://www.youtube.com/watch?v=GLsUhFawsZ8.

STRUCTURALISM

The term structuralism was used by P. Adams Sitney in relation to the condensed forms of films by filmmakers such as Paul Sharits, Hollis Frampton, Michael Snow and Tony Conrad that emerged in the sixties and early seventies. "Structural film" artists created simplified, sometimes even predetermined art. It was the shape of the film that was crucial while the content was often only of peripheral consideration. Sitney identified four formal characteristics common in Structural films:

1. a fixed camera position
2. a flicker effect (strobing due to the intermittent nature of film)
3. loop printing
4. Rephotography (of the film frame).[2]

These four characteristics may not all be present at once in the structuralist film but they are all strategies present in the Sherwin films under consideration in this chapter.

The structuralism of the American avant-garde took another more rigorous Marxist approach when it made its way to the shores of the United Kingdom. Peter Gidal, one of the most active members of the London Filmmaker's Co-Operative, set out the conditions of what he terms structuralist/materialist film in his 1976 essay "Theory and Definition of Structural/Materialist Film."[3] Gidal uses the term *structural/materialist* rather than Sitney's term *structuralist* to describe roughly the same body of films. Gidal is critical of what he saw as American structural film's romanticism and thinks that sound film must have a material function to operate usefully and equal emphasis must be put on both halves of the structuralist/materialist term.

According to Gidal the structural/materialist film attempts to be a non-illusionist form of film that "deals with devices that result in the demystification or attempted demystification of the film process."[4] These films do not represent or document anything but attempt to destroy illusion and decipher the structure of film and reconstruct, clarify and analyse it. In addition they have a dialectical function that works in opposition to dominant narrative cinema so they sought to eradicate any content with which identification could be made. Sherwin's films use geometric, abstract and non-figurative images. There are no people (intentionally) present in his optical sound films and if they are present, they serve the same function as the abstract images.

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[2] Sitney, *op. cit.*
[3] Gidal, *op. cit.*
[4] *ibid*., p. 1.

The process of film rather than the content was of the utmost importance of the structuralist/materialist filmmakers. Gidal and the members of the London Filmmakers' Co-Operative viewed each film as a record of its own making rather than a reproduction so essentially each film is a production rather than a reproduction. The viewer is both watching the film and also watching the film coming into being. This is clearly demonstrated in Sherwin's optical sound films such as *Cycles #1* (1972) and *Phase Loop* (1971) as they both involve direct-to-film cameraless animation techniques.

The structuralist/materialist filmmakers used devices such as loops to minimise the content so that the film could function simply as a film. In addition the use of the loop steers the film past its content and brings back the film event again and again. The structural film also uses specific devices such as repetition within the duration of the film in an attempt to decipher the film's construction and decipher the transformations. Sherwin's most marked use of the loop is in *Phase Loop*, an entire film constructed out of a single loop. These are all devices also used by composers such as Steve Reich, composers of musique concrète and electronic composers like Delia Derbyshire.

The structuralist/materialists employed real-time single takes or segments in structuralist/materialist films for their actual duration. They eschewed the idea of the illusionistic time presented by the Eisensteinian theories of montage present in narrative film.[5] Sherwin's optical sound films, reflecting their relationship to music, unfold in real-time.

The idea of self-reflexiveness is an important precept of structural-materialism. There is an inherent self-consciousness in their modes of filmmaking with film reflexiveness functioning to present a sense consciousness to the self. The process of production becomes interlinked with filmic practice of viewing a production. The filmmakers are constantly drawing attention to the existence of the film as a construct. Sherwin makes the viewer aware of the materiality of the film, both visually and sonically.

Earlier in this chapter I drew attention to Gidal's assertion that technique and aesthetic are inseparable.[6] Further to this he writes that "access to involvement with technique is the basis of all arts that seek to ask question"[7] and states that involvement with technique has two results. The first is that inventions make the aesthetic possible but are also inseparable from the aesthetic. The second is that aesthetic usage is intimately linked

[5] For a greater explanation of Eisenstein's theories of montage see Sergei Eisenstein, *Film Form: Essays in Film Theory*, 1949, London, Harcourt Brace Jovanovich.
[6] Gidal, *op. cit.*, p. 18.
[7] *ibid*.

to technical potential.[8] This is certainly true in the case of Sherwin's optical sound films. His thorough exploration of the technical processes of film became the basis of his audio-visual aesthetic. Likewise his audio-visual aesthetic influenced the techniques that he developed. In a video interview with the Lux film archive Sherwin states:

> I kind of like the idea of the sound being something that is integral right from the start and as it even comes out of the same processes as the picture. So the ones where I'm using the, what I call optical sound films where I'm taking, say, images of a pattern or it might be of a staircase or railings or something and those images fall into the soundtrack area and they are simultaneously making the soundtrack so that's one kind of way of sort of physical connection between the picture and sound.[9]

This echoes McLaren's intentions with his visualisation of the sonic material of the soundtrack on both the sound and visual tracks in *Synchromy*.

As the structuralist/materialists saw the need for a practice integrated with theory a problem arose over the question of continuing to make films without a distinct theory. Both Sherwin and Gidal admit that their films were created before a unifying theory was in place and that the theory came later. Essentially structuralist/materialist film theory is a retrospective history, which functioned as a basis for its own practice but even a retrograde work was a necessary step towards being equipped to deal with structuralist/materialist film. In spite of this contention Sherwin does seem to have an underlying cohesive strategy to his optical sound films that was conceived prior to making them. Each film is concerned with investigating the correlation between sound and image. According to Sherwin what links the films is:

> ... the physical correspondence between sound and image. In many of the films, sounds are produced directly by the images that we are seeing. The idea of *optical sound* may seem like a contradiction but in the analogue medium of cine-film, perhaps surprisingly, sound and image are both carried in visual form on the same filmstrip.[10]

STEVE REICH: PHASE MUSIC

Although I have indicated a link between Sherwin's work and musique concrète, Sherwin himself has cited American minimalist composer Steve Reich as an influence on his work. I have already discussed Reich's minimalism in relation to Eastern musical structures earlier in this thesis but this does not appear to be a factor in the compositional structure of Sherwin's films. What Sherwin does appear to have appropriated from Reich

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[8] *ibid.*

[9] Guy Sherwin, Interview, *op. cit.*

[10] Guy Sherwin cited in *Kill Your Timid Notion* festival program notes 2008. www.arika.org.uk/kytn/2008/the-festival/11-10-2008/21-30.php [Accessed: 21st February 2010]

is his use of *phasing*, *looping* and most importantly Reich's stress on the importance of *process* in the structuring of material.

Reich's music relies on repetition and gradual process. To Reich the piece of music is a process that should be heard as it is occurring. In his 1968 manifesto "Music as a Gradual Process" he writes:

> Musical processes can give one a direct contact with the impersonal and also a kind of complete control, and one doesn't always think of the impersonal and complete control as going together. By 'a kind' of complete control I mean that by running this material through the process I completely control all that changes.[11]
>
> While performing and listening to gradual musical processes one can participate in a particular liberating and impersonal kind of ritual. Focusing in on the musical process makes possible that shift in attention away from *he* and *she* and *you* and *me* outwards towards *it.*[12]

Essentially Reich's music can be encapsulated in the following two points.

1. Music is a process and is the subject not the source of the music.
2. The process of music should happen gradually and slowly in order to draw attention to the process and, what Michael Nyman refers to as, "the inevitability of its gradualness."[13]

Both of these strategies underpin Sherwin's optical sound films. In Sherwin's film the process of the film occurring over time is in the main more important than the content of the films. In *Phase Loop* Sherwin employs the most basic imagery open to him by punching a circular hole through black film stock in order to explore the process of the audiovisual correspondence and phasing.

Reich's work can be defined by a technique called phasing by which two identical melodic patterns gradually fall out of synchronisation with each other before falling into unison again. Reich discovered the process by serendipitous accident but developed it into a full compositional style.

During his time studying under pioneering composer Luciano Berio in Mills College in Oakland, California in the early sixties, Reich adopted the twelve-tones of serialism as a compositional technique but his heart does not appear to have been truly in it. Rather than transpose or retrograde the twelve-tone row that was the basis of a piece of serial music Reich would simply repeat the row continuously until some semblance of harmony would creep in, which is exactly what Sherwin was exploring with his film *Phase Loop*. Ultimately he rejected it because it bore no relation to the world around him and he

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[11] Steve Reich, "Music as a Gradual Process," 1968, www.columbia.edu/cenmtl/draft/ben/feld/mod1/readings/reich.htm, [Accessed: April 13th 2010].

[12] *ibid.*

[13] Nyman, *op. cit.*, p. 151.

viewed it as a European tradition, not an American one.[14] He was more interested in the purer tonality that he was hearing in jazz music of the period, especially that of John Coltrane. Coltrane's piece "Africa Brass" in particular made a big impression on Reich as it is based on ruminations around a limited numbers of harmonies. Reich has stated that it demonstrated that "you can stay put harmonically and make a music which is interesting."[15] [16]

American minimalist music as composed by Steve Reich is influenced by Eastern musical structures and philosophy in addition to Jazz music as developed by John Coltrane. Reich is also influenced by the tape techniques of musique concrète and developed the idea of repeating short patterns as a compositional technique by experimenting with tape. This is clearly demonstrated in Reich's composition "It's Gonna Rain." Reich recorded a street preacher proclaiming the coming of a devastating flood in Union Square in San Francisco. When the preacher uttered the words *it's gonna rain* a pigeon took off and the flapping of the wings coincided with the articulation of the words. When the phrase was looped the words combined with the rhythm of the pigeon's flapping wings to create what Reich refers to as a pigeon drummer.[17]

The pieces were arranged so that there were two loops, organised so that the sounds emerged 180 degrees from each other in canon.[18] The two loops begin in synchronisation and gradually move out of synch before falling back into unison once again. Reich writes:

> What's really riveting is the process of starting in unison and gradually separating in unison, passing through all these different canonic relationship; these different mini-rounds and coming to various recognisable musically interesting parts and these rational resting part. And finally, if you let it go it comes back together again.[19]

Sherwin applies Reich's process of phasing to *Phase Loop*. *Phase Loop*, a twelve second continuous loop filmed in black and white was Sherwin's first 16mm sound film. Sherwin asserts although the film was simple to make it is in fact "perceptually (to the eye

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[14] Steve Reich, Interview for "Steve Reich" episode, *The Southbank* Show, Season 30, Episode 12, December 10th 2006, London, I.T.V.

[15] *ibid.*

[16] Interestingly in 1961, approximately the time that that Reich was studying in San Francisco, Coltrane was becoming increasingly interested in Eastern music and began to correspond with Ravi Shankar before subsequently incorporating aspects of the Raga into the structure of Jazz compositions such as "India." "India" incorporates a Dorian mode that is sounded out on Coltrane's saxophone. The supporting instruments serve to provide the drone with a "constant rhythmic counterpoint."

[17] Steve Reich, Interview, *op. cit.*

[18] A device in counterpoint whereby a melody in one voice (or part) is imitated throughout, note for note, by one or more other voices, which normally begin after the first voice and overlap it. Scholes, Percy, et al, "canon" in *The Oxford Companion to Music*, Alison Latham (Ed.), Oxford Music Online, [Accessed: June 1st 2010]. http://www.oxfordmusiconline.com/subscriber/article/opr/t114/e1115.

[19] *ibid.*

and to the ear) surprisingly complex."[20] The imagery consists of a hole punched in the centre of each frame at intervals of one second. Sherwin made a single scratch that produces a tapping sound in the soundtrack area at a slightly longer interval of every twenty-sixth frame. Sherwin then joined the film into a loop. As the loop runs through the projector the tapping sound of the scratch falls behind the circular light circle on the image track before eventually catching up. In his notes for the film Sherwin writes:

> Contained in this simple loop, divided evenly between the senses of sound and sight is a microcosm of film's temporal experience: synchronisation and its loss, repetition, reflection, syncopation, anticipation, resolution.[21]

In this statement Sherwin is drawing attention to the fact that, as with absolute music and visual music films such as McLaren's minimalist *Line* trilogy, his simple phased loop composition could function concurrently on both a formal material level and a transcendental one. The sound remains a constant rhythm on the soundtrack due to the fact that the soundtrack is connected in a loop but the pitch and length of the taps varies for each. Likewise the dots punched into the image track are not strictly uniform and do not always appear in the same position in the centre of the frame. The sound and image become asynchronous before falling back into synch just like Reich's phase pieces, particularly Reich's second phase piece "Piano Phase" (1967).

As Sherwin's optical sound films are so influenced by the structure of Reich's phase music it is worth taking some time at this juncture to explore what exactly phase music involves. Reich first experimented with phasing in his tape composition "It's Gonna Rain" (1965). This composition was created by a machine process but Reich was curious as to what would happen if he attempted to explore the same processes in a live context with musicians playing instruments. "Piano Phase" was Reich's first live piece. The piece consists of two pianists playing a twelve note, even semi-quaver melody of five different modal pitches in unison with itself on both pianos. The lead player begins repeating the note pattern before the second pianist enters in unison. The lead player speeds up until the distance separating the two players is a full semi-quaver. This phasing continues until the pianos fall back into unison again. There is no score and the pianists were required to find their rhythm through carefully listening to the other pianist.

Reich asserts that once a pattern is constructed and set in motion by a pre-conceived meticulously delineated process further intervention is not necessary. This is clearly demonstrated in his composition "Pendulum Music" in which two or more microphones are suspended above speakers. The microphones are pulled back like a swing

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[20] Guy Sherwin, *Optical Sound DVD*, 2009, p. 10.
[21] *ibid.*, p. 11.

and allowed to swing back and forth like a pendulum. As the microphone passes by the speaker a feedback tone is generated. The process of swinging the microphones is actually creating the music. The microphones and therefore the music gradually slow over time and the piece ends after the microphones have come to rest and feed back a steady continuous tone. Due to the influence of gravity on the movement of the microphones "Pendulum Music" comes to a natural cessation. In contrast, the open-ended process of "Piano Phase" requires external intervention to end the process. A set point is decided to terminate the piece, which continues for a full cycle of twelve phases before closing in unison. Sherwin's looped films, specifically *Phase Loop,* require manual intervention to halt the film.

Following time spent studying African drumming in Ghana Reich created the phase piece "Drumming" (1971). The basis of "Drumming" is a single rhythm pattern that is developed through phase shifting. There is a gradual separation as the same pattern is performed by different percussion instruments. Throughout the piece nothing is changing in the piece but the phase relationship between the rhythmic units. A constant timbre is retained by virtue of using groups of identical instruments. In addition, a constant musical register and musical space is maintained. As with "Piano Phase" there was no written notation for the piece and the drummers were required to memorise the musical sequences in advance leaving no room for improvisation or deviation. Reich maintains almost total control over the outcome of this and all of his phase compositions through this strict limiting of digression.

Something similar is occurring in Sherwin's film *Cycles 1* (1977). Sherwin constructed the film by sticking paper dots onto the surface film image track and the soundtrack. The dots are converted simultaneously into picture and sound during the process of projection. Although strictly not a phase piece in the same manner as *Phase Loop* or "Drumming" there is a phase effect occurring in *Cycles 1*. As the film progresses the space between dots is eroded gradually until the images fuse into what Sherwin refers to as a pulsating ball of light" and the rhythmic sounds coalesce into a hypnotic drone.

Reich was interested in structures that cannot be heard. British musician, composer and producer Brian Eno talks about the dramatic effect that "Its Gonna Rain" had on him. He could hear all manner of complex material in the deceptively simple structure. He refers to the structure of the piece as "aural moiré patterns"[22] Moiré patterns are constructed from the superimpositions of two simple patterns, for example parallel lines. When these lines are superimposed and moved in relation to each other complex and

[22] Steve Reich, Interview, *op. cit*.

unexpected movements emerge. Likewise in "It's Gonna Rain" and, indeed, all of Reich's phasing compositions, by virtue of the phasing process, the patterns and relationships between instruments is constantly shifting and changing.

The harmonies in the phasing pieces are never resolved yet Reich maintains that there are still "mysteries"[23] to be found in his phase pieces

> The use of hidden structural devices in music never appealed to me. Even when all the cards are on the table and everyone hears what is gradually happening in a musical process, there are still enough mysteries to satisfy all. These mysteries are the impersonal, unattended, psycho-acoustic by-products of the intended process. These might include sub-melodies heard within repeated melodic patterns, stereophonic effects due to listener location, slight irregularities in performance, harmonics, difference tones, etc.[24]

Nyman points out that some of the different sound patterns that arise are "sound objects thrown up in the natural process but which have absolutely no existence separate from the flow of the constant rhythmic stream."[25]

In his essay entitled "Pattern Structure and Process in Steve Reich's Piano Phase," Paul Epstein posits that the mysteries "stem from the fact that while the process is continuous; our perception of it is not."[26] This means that the audience is in essence constructing their own experience of the music. The composite subpatterns and reconfigurations that emerge through the phasing process can impose themselves on the listener or can alternatively be cultivated by the listener. This is echoed by Eno, who states that Reich's tape pieces, and by virtue of the same use of the same processes, his live pieces, take advantage of the creativity of the brain by

> transferring the job of being the composer into the brain of the listener so it is saying to the listener "your brain is actually making this piece of music because you knew what the ingredients were. There was nothing mysterious about how the piece works.[27]

Sherwin is also relying on the ability of the brain to identify particular markers such as the point of unison and construct the pattern of the film.

Epstein suggests that the unison phase in "Piano Phase" is important and that the reappearance of unison is such an event because "as the pattern emerges and finally locks into phase, we are reminded that, however obscured, it has been there all along." This idea could be extended to *Phase Loop*. As the film gradually moves back into audiovisual synchronisation we remember that there was a moment of unison at the outset.

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[23] Steve Reich cited in Nyman, *op. cit.*, p. 155.
[24] Steve Reich, "Music as a Gradual Process," *op. cit.*
[25] Nyman, *op. cit.*, p. 155.
[26] Paul Epstein, "Pattern Structure and Process in Steve Reich's Piano Phase," *The Musical Quarterly*, Vol. 72, No. 4, 1986, p.497.
[27] Brian Eno, Interview about Steve Reich for "Steve Reich" episode, *The Southbank Show*, Season 30, Episode 12, December 10th 2006, London, I.T.V.

Although I have already stated that Sherwin was primarily more concerned with process than composite material there are a number of Sherwin's films however in which particular emphasis is placed on the visual material. Sherwin, like Reich in his phase pieces, tends to produce works in series, in order to explore an idea to its fullest potential. An important factor in the series that he has labelled "Sounds Made with a Camera" is the process investigating the particular sounds that shapes make such as *Soundtrack* (1977).

Sherwin describes *Soundtrack* as "an uninterrupted shot from a speeding train, looking down onto the changing pattern of the railway lines."[28] It was the first of four films that he made exploring what sounds filmed images would make if they were printed on a soundtrack. In *Soundtrack* Sherwin printed the continuous image of railway tracks onto the soundtrack so that the audience is both hearing and seeing the railway tracks.

The materiality and image tone has an effect on the quality of the sound produced. Areas of light increase the volume, while the shadows and dark areas lower the volume. As the train passes through a tunnel and the image imprinted on the sound and image track is black there is still a constant rhythm being sounded out by the soft clicks of the tape joins thus drawing attention to the fabric of the celluloid and the artifice of both the auditory and film construct. This film differs from not only McLaren's efforts at photographing images on the soundtrack but also Sherwin's subsequent efforts in the series. In *Soundtrack* Sherwin is attempting to see what mysteries are revealed by the process of hearing the sound of the moving image of the train, just as Fischinger was endeavouring to see what would happen if he photographed graphic shapes onto the film soundtrack.

The next film in the series, *Musical Stairs* (1977) sees Sherwin not only exploring what effect filmed images produce but also attempting to create a rudimentary musical composition with the visual and sound images. Sherwin filmed the iron staircase in front of the London Filmmaker's Co-Operative from a fixed position and then transposed the images onto the soundtrack. He managed to make an approximate musical scale in eleven tones by tilting the camera up and down; the more stairs in a frame the higher the pitch of the corresponding sound. The exposure of the film equated to the volume of the sound; the darker the image on screen, the louder the sound heard from the speaker. The film is structured around a series of ascending and descending rhythms. People appearing on the stairs provide an interruption, while leaves on the stairs add timbre. Sherwin seems to have been more concerned with the process of creating the ascending and descending

[28] Sherwin, *op. cit.*, p. 44.

scales, in addition to the overall rhythmic structure of the film, than producing anything other than a rudimentary repetitive melody from the musical tones.

Sherwin revisited his optical sound films that were made in the seventies, often re-working them in a gallery installation context in order to further explore the relationship between picture and sound in a live situation. Sherwin asserts that he is "using the projectors as performing instruments and trying to get the condition of film projectors a little bit closer to the condition of music as a live visual event."[29] This is another way that Sherwin's approach to synthetic optical sound differs from McLaren's. *Synchromy* is designed to function like Belson and Whitney's cosmic films as a complete controlled recording. Sherwin's films on the other hand are essentially, the raw optical sound recordings captured on screen. This reworking of his work in alternative contexts is another characteristic that Sherwin shares with both Fischinger and Reich. Steve Reich explored something similar in 2000 in an audio-visual composition entitled *Piano Phase/Video Phase*, in which he added the visual dimension of a drummer performing with a video of Reich himself in real-time with the musical composition.

Sherwin's optical sound films, although exploring similar territory, function in a different manner to McLaren's synthetic sound films. They can be read as a combination of structural/materialist film theory, the London Co-Operative, music, audio-visual correspondence and the phasing compositions of Steve Reich. His films are fundamentally a series of experiments investigating not only the relationship between sound and image but also the essence and materiality of film itself. This is in part due to the context of Sherwin's work, which informed his aesthetic decisions. McLaren's aesthetic and technical decisions were often influenced by his wish to cater to a mass audience that was perhaps more accustomed to the aesthetics of mainstream cinema. At times this steered him away from pure formalism and towards degrees of figuration or anthropomorphism within many his abstract films. This did not occur in all of his visual music films but he frequently made concessions to a mainstream audience even within his more formal investigations. The visual arrangements of *Synchromy*, with its introduction of colour, duplication of visual material, playful movement of the striations around the screen, combined with the simple chip-tune melody makes *Synchromy* more accessible than Sherwin's work. Sherwin's optical sound films are more concerned with formal investigations and were designed to be seen and appreciated by a visually erudite cine-literate audience and make no concessions towards entertainment. This thesis does not

[29] Guy Sherwin, Interview, "Guy Sherwin – Artist's Interview." *op. cit.*

mean to pronounce that one approach to creating synthetic soundtracks is superior or more favourable to the other. Both of these approaches have different underlying ideologies and both approaches have their merits. Ultimately, however, Sherwin's process, like that of Reich is more determining than McLaren's.

In conclusion, this chapter has demonstrated that creative and economic necessity begets innovation in technical practice in the field of the visual music film. The evolution of visual music is wholly dependent on the experimentation of individual filmmakers to create and adapt technical processes to conceive methods best suited to not only their practice but also to particular types of music. Yet within this process of technical development there still remains room for artistic intuition and improvisation in the determination of the films' final aesthetic. Some of the filmmakers such as Sherwin designed a process that dictated the main outcome of the film but other such as McLaren and Lye made decisions that were not governed by process but rather by independent judgement. It was often a case of something *fitting together*.

This chapter has also considered the development of colour processing as an additional composition tool to greater reflect *musical colour,* create more cohesive audiovisual correspondences and cultivate an enhanced cross modal experience. Furthermore, it looked specifically at Oskar Fischinger's experiments to develop the subtractive Gasparcolor process in order to create his "colour play" *Kreise*. Supplementary to this an investigation into direct animation techniques as a tool for both engaging with the physical materiality of film and for creating scope for visual improvisation was carried out. A close analysis of *Begone Dull Care*, Norman McLaren's collaboration with Oscar Peterson, and *A Colour Box* by Len Lye demonstrated that direct animation was the filmic process best equipped to capture the fluidity, invention and complex rhythmic patterns of jazz music.

The second half of this chapter examined methods that developed in the twentieth century in order to construct synthetic soundtracks that could be married to visual tracks to promote greater inter-sensory correspondence. This part of the chapter traced the two approaches that evolved in relation to creating the synthetic soundtrack. The first approach, engineered by Rudolf Pfenninger and Laszlo Moholy-Nagy, advocated the creation of a new form of *acoustic hand-writing* that would allow composers to create new forms of sound directly onto magnetic tape. Norman McLaren, influenced by Pfenninger's ideas, used this technique of *acoustic handwriting* to create a composition that functioned on both the sound and visual track in his film *Synchromy*. The second form of synthetic

sound, associated with Oskar Fischinger, is in ideological contrast to the concept of creating synthetic sounds with which to compose. It is instead concerned with *sound ornaments*; the images that particular sounds produce. Guy Sherwin combined these *sound ornaments* with Steve Reich's ideas on phasing in order to explore visual sounds and the effects of perceptual shifts on the audiovisual experience.

Ultimately what this chapter has established is that just as the concept of visual music is constantly evolving and mutating so too is the technology that creates it. This idea will be given further consideration in the following chapter, which will explore the innovations that occurred in the visual music film in line with the development of the computer in the twentieth century. This will be achieved by examining the visual music films of American computer animation pioneer John Whitney, who used conceptions of mathematical harmony to create his distinctive body of visual music.

CHAPTER 5:

MATHEMATICS AS VISUAL MUSIC IN THE WORK OF JOHN WHITNEY

In his inaugural address as the Simonyi Professor for the Public Understanding of Science at Oxford University, mathematician Marcus de Sautoy stated:

> Without maths we're lost in a dark labyrinth. It's the glue that binds scientific and artistic cultures. The language of numbers and symmetry is spoken everywhere.[1]

Of course de Sautoy is not the first person to understand the importance of mathematics as a universal language binding together the seemingly disparate realms of science and art but this statement encapsulates the importance of mathematics as a governing force underpinning both cultures. For thousands of years it has been acknowledged that there is a mathematical harmony that governs music. From the time of Pythagoras through to Aristoxenus and Boetheius attempts have been made to translate this idea of mathematical harmony across disciplinary boundaries. It is this universality and transmutability that makes mathematics the ideal language for a visual music in which there is a 1:1 equivalency between the image and music, a visual music where the sound and image share the same mathematical code, a visual music in which we are literally seeing the sound.

The previous chapters have covered historical and technical approaches that have been used in the composition of the visual music film. They have, in addition, examined the manner in which it has been analysed in terms of the musical analogy be it formally, philosophically, structurally or synaesthetically. This chapter will explore another way of looking at the visual music film by investigating American visual music filmmaker John Whitney's philosophy of *digital harmony* and his attempts to create visual music films through the use of visual structures drawn from mathematics. In the preceding chapter I discussed attempts by Norman McLaren and Guy Sherwin to create films which came close to enjoying a relationship of equivalence. Whitney's method however, differs from these approaches. Rather than the audience simply seeing the sound embedded on the film frame, Whitney's films are predicated on the idea of mathematical harmony underlying

[1] Marcus de Sautoy, "Inaugural Speech as the Simonyi Professor for the Public Understanding of Science," www.timesonline.co.uk/tol/comment/columnists/guest/contributors/article6932402.ece, [Accessed: January 10th 2010].

everything. Whitney was attempting to create complete harmony between sound and pictures by making 1:1 correlations based on underlying mathematical code that could be translated into both image and sound. He initially investigated this through use of mechanical pendulum systems before progressing to digital computer systems as technology progressed over the course of the twentieth century. Whitney was not the only visual music filmmaker to attempt to introduce a mathematical foundation into the visual music film but he was arguably the first to explore the relationship between the musical and visual worlds so thoroughly on such a formal level.

CONCEPTIONS OF HARMONY

Whitney collected his theories on visual music in his highly influential book *Digital Harmony: on the Complementarity of Music and Visual Art*.[2] This treatise, documenting the philosophy underpinning his visual music work, confirms not only how acutely aware Whitney was of the enduring idea of mathematical harmony underpinning the arts but how it ultimately became the basis of his life's work. In *Digital Harmony* he writes: "the foundation of my work rests first upon law of harmony, then in turn, upon proof that the harmony is matched, part for part, in a world of visual design."[3] This hypothesis assumes the existence of a "new foundation for a new art" based on musical, and therefore by extension mathematical, principles that operates in a broader context in which Pythagorean laws of harmony operate. Whitney dedicated his career to the task of producing films that went some way to proving this.

So bearing in mind the centrality of harmony to Whitney's work and the frequency at which the term occurs in his writing, one must question to what exactly Whitney is referring when he uses the term *harmony* in relation to his work? The term harmony is extremely ambiguous and open to a host of meanings. More generally the term has come to be associated with music. In its most literal sense it can be taken to mean the concurrent sounding together of notes. Scholes describes harmony as the "clothing of melody"[4] by which he means the parts or voices that accompany the main melody, producing a progression of chords. It is this collation of musical notes, parts and voices into chords that produces harmony as it has come to be recognised in Western Art Music. And as I made reference to earlier in this thesis in relation to the visual music films of McLaren,

[2] John Whitney, *Digital Harmony*, *op. cit.*
[3] *ibid.*, p. 205.
[4] Scholes, *op. cit.*, p. 441.

Belson and James Whitney, this type of harmony is generally eschewed in Eastern music or Western music drawn from Eastern influences.

As this thesis has continuously pointed out, music is typically represented as a horizontal structure, unfolding horizontally left to right on the staff of an orchestral score in order to best represent its temporal qualities. Harmony can therefore be thought of as the vertical structure of the score with multiple staffs or notes combining coalescing to create a harmonic structure. So what does this mean in terms of the audiovisual structure? If one thinks back to Eisenstein's theories of audio-visual montage as outlined in Chapter One. Eisenstein draws on this idea of vertical integration in the type of orchestral score characteristic of Western art music, envisaging the visual track as another staff on the audio-visual score. Likewise Chion makes an even better case for the harmonic status of the vertical audiovisual structure.

The term harmony, however, bears other meanings. It was initially envisaged by the ancient Greeks as the concept of *fitting together*. I do not wish to delve too deeply into historical conceptions of harmony in ancient Greece. I am only interested in the aspects of harmony that I see as relevant to my discussion of John Whitney and his conception of harmony. What is most important about Greek conceptions of harmony or fitting together is that they came to function synonymously with music, nature and society. The ancient Greeks believed that works of art and societal structure were a reflection of nature rather than mere machinations of man. Musicologist Edward Lippman points out that the reverse process was also in operation, writing:

> The interrelation of man and the world brought ideas of natural order into the human province and infused ethical and religious and aesthetic values into the sphere of nature. In addition, this generalised order was distinguished by having character, and was typically thought of as harmonic.[5]

This idea of harmony was founded on rational rather than mystical factors. Yet this does not automatically mean that their conception of harmony involved numbers or measurement. It was simply a matter of *fitting together*. Music, as this thesis has frequently mentioned is one of the superlative examples of *fitting together*. The listener can *know* on an emotional level whether or not music *fits* together, whether it is harmonious or disharmonious. In the same fashion one can simply know if something looks to be correct or not. This type of harmony is different from the type of musical harmony that I discussed above.

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[5] Edward A. Lippmann, *Musical Thought in Ancient Greece,* 1964, New York: Columbia University Press, p. 1.

The Pythagorean conception of harmony predicated on mathematics was to exert a profound influence on Whitney's ideas of digital harmony. The Pythagoreans, who were followers of ancient Greek Ionian philosopher Pythagoras, considered music, the cosmos and number to be synonymous; music was number, number was the cosmos and the cosmos was music. Aristotle sums up the core of their philosophy in *Metaphysics*:

> The Pythagoreans, as they are called, devoted themselves to mathematics; they were first to advance this study, and having been brought up in it they thought its principles were the principles of all things. Since of these principles numbers are by nature the first, and in numbers they seemed to see many resemblances to the things that exist and come into being; since, again, they say that the attributes and ratios of the musical scales were expressible in numbers; since, then, all other things seemed in their whole nature to be modelled after number, and numbers seemed to be the first things in the whole of nature, they supposed the elements of numbers to be the elements of all things, and the whole heaven to be a musical scale and a number.[6]

The Pythagoreans, like Eastern musicians, distinguished three types of music.[7] The first, *musica instrumentalis* was the type of sound that society typically considers to be music. It the music produced by plucking the string of a lyre or striking the key of a piano. The second type of music was *musica humana*, the continuous unheard music that is produced by each human organism; the beating of the human heart, the whistle of respiration, the buzz of the nervous system. This is the type of music experienced by John Cage during his time in the anechoic chamber at Harvard University.[8] To the Pythagoreans this unheard sound was the soul and body resonating in harmony with each other. The final category was *musica mundana*, the music of the cosmos that is also known as the *music of the spheres*. This is supposedly the sound made by the celestial bodies as they move through the universe. Obviously there is a discernible discrepancy of scale between the three categories but similar to the manner in which Jordan Belson and James Whitney managed to reconcile the microcosm and macrocosm through their undulating gaseous circular imagery, the ancient Pythagoreans managed to bring together the three musical realms through the use of mathematics. They believed that mathematics governed the entire universe from the tiniest sub-atomic particle to the movement of the planets. Further to this the Pythagoreans considered music to be a healing salve; plucking the string of one instrument could stimulate sympathetic vibrations in the instrument of the

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[6] Aristotle, *Metaphysics*, W.D. Ross (Trans.), 1924, Oxford: Oxford University Press.

[7] See Chapter Three for an explanation of the three types of music in Eastern musical thinking.

[8] John Cage visited an anechoic chamber, a room designed to absorb sound, at Harvard University in order to experience *silence*. He was surprised to hear two sounds, one high and one low. He subsequently discovered that the high frequency sound was produced by his nervous system, while the low frequency sound was produced by his circulatory system.

human body. Of course this was never subject to true scientific scrutiny by the Pythagoreans but subsequent tests in modern times have proved that music does have a discernible effect on the emotions and the treatment for particular disorders such as Alzheimer's disease and schizophrenia. Studies undertaken by the Wellcome Trust and M.I.T. Media Lab have looked into the effects of music on autism spectrum disorder and human emotions. Even these studies are yielding qualitative rather than empirical results but the results are still tangible and music therapy remains a respected treatment for many disorders.[9]

The effect of sound on the human psyche is profound. Music has been used to disorientate and torture prisoners in Abu Graib prisoner and Guantanamo Bay.[10] Director Gaspar Noé exploited the psychological effects of sound in his film *Irréversible* (2002) by emitting a constant 27 Hz tone that was specifically designed to cause nausea and discomfort in the audience.[11] People have been quick to bend the power of sound to their own ends from parents using lullabies to lull their babies to sleep to the Nazi propaganda machine using the Teutonic might of Wagner to whip crowds into a political frenzy. J.S. Bach purportedly composed the "Goldberg Variations" (1741) to help the harpsichord player of the title soothe his patron, the insomniac aristocrat Count Kaiserling, to sleep by playing to him from a room adjoining his bed chamber. Many musicians have gone so far as to associate emotional characteristics with different keys. For example Beethoven, whose musical compositions were also used by the Nazis in rallies, described D flat major as majestic and C major as triumphant. Likewise Pythagoras considered the Phrygian mode to have warlike characteristics.

Music, as previously stated, is predicated on mathematics; the physics of sounds, the arithmetic of rhythm and the algebra of scales. Musical scales are literally mathematical calculations made sonically manifest. Scales are made by mathematically fixing ratios into steps that can be fixed into a progressive series of sounds. Arguably Pythagoras' most lasting contribution to music, as it has come to be understood, was his discovery of the mathematical relationship between harmonic intervals. As Jamie James points out, there is a problem when trying to unravel the mystery of Pythagoras and his

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[9] See Jean Hwang, "Music Wins Applause for Addressing Autism," *The Washington Post*, March 3rd 2009, http://www.washingtonpost.com/wp-dyn/content/article/2009/03/02/AR2009030201759.html, [Accessed September 10th 2010].

[10] Clive Stafford Smith, "Welcome to 'the disco,'" *The Guardian*, http://www.guardian.co.uk/world/2008/jun/19/usa.guantanamo, [Accessed: September 10th 2010].

[11] Gaspar Noé, "The Friendly Ghost: Gaspar Noé defends *Irréversible*," *Cinemascope*, vol. 4, no. 2, 200, p. 50.

philosophies as his followers were sworn to secrecy and further to this none of Pythagoras writing survives so we are forced to rely on second hand accounts of his beliefs and teachings.[12] In spite of this lack of primary texts the myth of how he discovered musical ratios has endured over the centuries. As these ratios prove important to the work of Whitney, particularly his early visual collaboration with his brother James using their self-engineered pendulum device it is worth exploring at this juncture.

The legend posits that Pythagoras was passing by a blacksmith's shop one day when he heard the blacksmith hammering a piece of iron on an anvil. Pythagoras recognised that certain sounds being produced by the hammering resulted in a concord that included the intervals of the octave, the fifth and the fourth. Pythagoras realised that the musical intervals that he was hearing were equivalent to the ratios between the weights of the hammer. A hammer that weighed six pounds produced a perfect 1:2 ratio that resulted in a perfect octave, an eight pound hammer and a twelve pound hammer produced a 2:3 ratio that was the equivalent of a major fifth musical interval and a nine pound hammer and twelve pound hammer resulted in a 3:4 ratio that produced an interval of a perfect fourth. These three intervals can be directly expressed in the figure of the tetractys, a triangular figure consisting of ten points arranged in four rows that was sacred to the Pythagoreans.

Following this discovery Pythagoras began to experiment at home. He attached a wooden stake to a beam and tied equal lengths of string bearing weights of different mass to it. Through this experiment he could prove that certain ratios produced certain sounds. For example, equal lengths of string tied a wooden stake to a beam in a ratio of 2:1 produced the sound of an octave when plucked. Pythagoras discovered that dividing a string into halves, thirds, or fourths produced segments that vibrated and emitted harmonious tones. If one string is divided into halves and an identical string is divided into third, the two vibrate with frequencies in the ratio of 3:2, which produces the interval of the perfect fifth, the second most consonant interval after the octave. Likewise, if one string is divided into thirds, a ratio of 4:3, the interval is a perfect fourth, which is also consonant.

Ultimately what Pythagoras proved through this experiment was that there was a mathematical basis for music and that there was an exact equivalence between the abstract domain of music and the abstract domain of numbers. Moreover, Pythagoras concluded that this mathematical basis governed the principles of the universe. Aristotle points out

[12] Jamie James, *The Music of the Spheres: Music, Science and the Natural Order of the Universe*, 1993, London: Abacus, p. 29.

that Pythagoras had reached the conclusion that the planets or spheres make sounds in their revolutions:

> The motion of bodies of that size must produce a noise, since on our earth the motion of bodies far inferior in size and speed of movement has that effect. Also, when the sun and the moon, they say, and all the stars, so great in number and in size, are moving with so rapid a motion, how should they not produce a sound immensely great? Starting from this argument, and the observation that their speeds, as measured by their distances, are in the same ratios as musical concordances, they assert that the sound given forth by the circular movement of the stars is a harmony.[13]

This union of the physical world with music and the cosmos through a shared basis in mathematical harmony exerted a profound effect on Whitney and his visual music films so for the purposes of this thesis the term *harmony* will be predominantly drawn from Whitney's mathematical conception of the word that is grounded in the theories of the Pythagoreans. However, harmony in many sense of the word can be evidenced throughout Whitney's work as will become manifest in the course of this chapter.

MATHEMATICAL HARMONY IN THE VISUAL MUSIC FILMS OF JOHN WHITNEY

Whitney had made primitive stabs at audiovisual composition out of the motion of the geometry of iron rivets in iron plates with a film camera while on board a freighter bound for Rotterdam during the late thirties but his first serious attempt at creating a visual music film was in collaboration with his brother James. Between 1943 and 1944 the Whitney brothers created a series of five film etudes or studies that came to be exhibited under the title *Five Film Exercises* by use of a home produced pendulum system. The Whitney's pendulum device is a fitting homage to the Pythagoreans who identified similarities between music, number and the cosmos. Whitney drew on Pythagoras' weighted pendulum system to invent a mechanical pendulum device that silently produced a conventional optical sound pattern on the motion picture film by virtue of the perfunctory action of swinging pendulums. A musical motif was played by starting and stopping each pendulum as specified by John's pre-written score. The sound patterns on the film were then developed and played back on a sound projector. Music was made "wave for wave, by the swing of a full-scale of pendulums."[14] The brothers managed to gain an inordinate amount of control over their system, achieving a four octave microtonal range and

[13] Aristotle cited in Jamie James, *op. cit.,* p. 39.
[14] John Whitney, *op. cit.,* p. 93.

managing to manipulate the timbre of the composition as the sound was being recorded. This demonstrates a real sense of rhythm, vision and musicality on the part of John in particular as he was required to maintain a sense of the totality of the finished compositions throughout the painstaking process. It also reveals an acute awareness of the mathematical ratios and frequencies required to produce a specific note.

The brothers were aware of the visual music films of such early visual music pioneers as Fischinger, Eggeling and Richter that had been composed prior to their efforts. Even though they obviously appreciated these efforts it is evident that they had a different underlying philosophy. Their main criticism was the creation of visual images in response to pre-existing musical compositions. The brothers and John specifically were adamant that their films should be original audiovisual compositions, in which the sound and image shared an equal partnership. This, as John Whitney's films *Permutations* and *Arabesque* demonstrates, was not always borne out.

Bearing the brother's feelings about the audiovisual relationship in mind, the film exercises demonstrate an early interest in translating musical patterns into visual patterns and subsequently unifying these into a harmonic totality. This was a revolutionary idea in the field of visual music as it was arguably the first time that an exact audiovisual correspondence was fully realised. Writing during the late 1970s, structuralist filmmaker and critic Malcolm LeGrice speculated in his influential book *Abstract Film and Beyond* that in spite of their primitive quality the brother's early exercises are *"*probably the most satisfactory combination of image and sound in the field of the non-figurative film."[15] Although LeGrice does not specify why he has reached this conclusion one can surmise that it is because of the steady rhythmic action and the sense of something being played and manipulated by hand. There is something haunting and hypnotic about the marriage of the moving neon images and the eerie electronic sounds.

The resultant hard-edged geometrical shapes are in a constant state of fluctuation and transformation in the screen space. Whitney describes his pendulum system as providing "an unequalled opportunity to integrate image and sound."[16] The uncomplicated mechanical instrument, that Whitney has modestly referred to as "primitive"[17] allowed for a simple form of frame-by-frame animation in which the production procedure was identical for both sound and image. This is not to say, however, that Whitney conceptualised the sound first, relying on the melody of his musical composition to

[15] LeGrice, *op. cit.*
[16] John Whitney, *op. cit.*, p. 92.
[17] *ibid.*

generate the visuals. Even at this early stage it seems that Whitney was concerned with ideas of audiovisual harmony and a relationship of equals between the spheres of sound and image and states *"*design ideas for image somehow stimulated counterpart sound ideas, and in turn sound pattern was literally mirrored, figure for figure, in an image/sound dialogue.*"*[18]

Whitney's mechanical instrument consisted of an array of pendulums which could be tuned through an adjustment of weights similar to the way in which the weights on clock pendulums are adjusted. The pendulum device, which due to operating at sub-atomic frequencies produced no sound, silently produced a conventional optical sound pattern wave by wave on the motion picture film by virtue of the mechanical action of swinging pendulums. Musical motifs were played by starting and stopping each pendulum as marked on the score. In order to hear them the sound patterns on the film were developed and played back on a sound projector. Whitney's pendulum instrument was therefore predominantly an instrument for "conceptualisation"[19] rather than an instrument that could be used for a live performance. This was not unusual in terms of the new breed of instruments being produced during this period. *New* electroacoustic instruments such as the Theremin required loudspeakers in order for the acoustic manifestation of their sound.[20] The main difference between these instruments and that of the Whitneys,' however, is that these instruments could be played in real time in a live performance situation. Whitneys' pendulum instrument creates musical material that requires an intermediary system to playback the composition. This requires that an entire composition be completed before it is performed. Any improvisation would have to be carried out during the swinging of the pendulums but as the process of generating a single sound wave is an incredibly slow and laborious procedure this was probably not conducive for any deviation from a pre-planned score or design. Although Whitney writes that the music he and his brother composed in the early 1940s on their pendulum instrument was more "relevant to the musical issues of our time than the tape splicing technology of the electronic music of the 1950s"[21] it is in many ways the Whitneys' mechanical system of composition that is a natural successor to Pfenninger's method of composing using a library of cards carrying pre-drawn sound

[18] *ibid.*
[19] *ibid.*
[20] The Theremin or Thereminavox was an electroacoustic instrument invented by Russian scientist Leon Theremin in 1920. It is unusual in its conception as it does not require physical contact on the part of the player to produce music. The performer control pitch and volume by manipulating their hands in proximity to two antennas. The Theremin produces an eerie, other worldly sound not dissimilar to that produced by the Whitney brother's pendulum device.
[21] John Whitney, *op. cit.*, p. 92.

waves. While philosophically the Whitneys may have been closer to the early creators of electronic music, they were still shackled to the procedures used by composers such as Pierre Schaeffer, whose compositions could not be realised live and required the intervention of a loudspeaker to play back the pre-recorded musical work.

This lack of *liveness* is not a fundamental problem in relation to Whitney's film work but as I pointed out earlier, he views GRAF as functioning like a piano so one could speculate that he desired to produce visual music that could function in a live or real time context. However he has equated the visual music makers who were producing live shows with infants "pounding on the keys of a piano" without training whereas he compares those working with computer aesthetics with somebody who has spent years "sharpening his sensibilities and manual dexterity" for seven or eight years in order to play a Beethoven sonata.[22] Perhaps this lack of sophistication and focus in live visual music events is one of the reasons for Belson's move away from the Vortex concerts to the more controlled environment of the visual music film.

According to Whitney this slow and laborious process of creating music by individual swings of a full scale of pendulums allowed composers or musicians unfettered access to minute intervals of time that they have never before had access to.[23] Theoretically this slow process, requiring sixty to eighty pendulums swung successively within one hundred seconds just to produce one second of real-time sound, affords the brothers the ability to sculpt conceptually with musical time, stretching and contorting each infinitesimal interval as though sculpting the essence of time. It is obvious how this idea would appeal to James Whitney in particular as evidenced in his later solo film efforts in which he attempted to condense the vastness of the macrocosm into the smallness of the microcosm. What is potentially more interesting than these micro intervals of *time* are micro intervals of *tone*. Whitney does not make reference to the ability of the pendulum instruments to create microtonal intervals. This was one of the unique points of Whitney's system at the time. One can speculate as to why this is. Perhaps at the time of the instrument's creation Whitney knew of no appropriate term for tones that existed between traditional tones. This was certainly the case with Luigi Russolo's family of *Intonarumori*, instruments designed in 1913 for the creation of noise that allowed for shifting modulations of pitch and dynamics through the manipulation of a cat gut or metal string encased within a wooden box controlled by a crank or an electric buzzer. A lever on the

[22] John Whitney, Interview, Youngblood, *op. cit.*, p. 214.
[23] John Whitney, *op. cit.*, p. 93.

top of the box controlled the tension and therefore the pitch of the string, while a drum head transmitted the resulting vibrations to an attached loudspeaker. Russolo and his brother Antonio, who also composed using the *Intonarumori,* may not have used the term "microtonal" in relation to their compositions but the special system of notation that Luigi developed for his instruments, which is still in use today by electronic composers, demonstrates extensive use of glissando sliding between pitches.

Even though Whitney was a trained musician and had studied music in university at Pomona College he probably would not have been aware of Russolo's work. The influence of the futurist musicians appears to have been conveniently inserted into the lineage of experimental music retrospectively. Even though experimental composers such as John Cage and Pierre Schaeffer composed music in a similar vein to the futurists it was undertaken independently due to a lack of awareness by many of its existence in the decades following the Second World War. Moreover, even though musicians such as Iannis Xenakis and György Ligeti were creating microtonal music at approximately the same time that the Whitneys were experimenting with their pendulum device, there is no evidence that the Whitneys were aware of these musical explorations. One could speculate that if they had been it would have had a greater influence on the structure and imagery of their *Five Film Exercises*. The tones and corresponding images are relatively discrete and geometric in both appearance and sound. The sound is relatively monophonic and *alien* sounding. It has a similar timbre to that produced by McLaren's hand-drawn soundtrack for *Synchromy* but the sound is softer and one can surmise from this that the brothers were using more rounded wave patterns in their compositions. The tones in the early film exercises have a sound not dissimilar to the *shooting* sound found in primitive *Star Wars* computer games produced by computer chips. In the later exercises there are timid glissandos in evidence. Had the brothers been aware of the gaseous glissando clouds of tones employed by Xenakis, Ligeti and Edgard Varese in his composition "Ionisation," perhaps the sound and consequently the imagery may have appeared more diffuse and amorphous. Curiously, although John was the trained musician it is James and his friend Jordan Belson who, as we have seen, successfully incorporated the *gassy* qualities of Xenakis and Ligeti's musical diffusions into the visual and rhythmic imagery of their films.

A New Language for a New Art

Whitney's efforts to create a visual music based on mathematical harmony necessitated the creation of an entirely new language. The following statement encapsulates Whitney's philosophy for a new universal audiovisual language derived from mathematical harmony:

> Music, as the true model of temporal structure, is most worthy of study among prior arts. Music is the supreme example of movement become pattern. Music is time given sublime shape. If for no other reason than its universality and its status in the collective mind, music invites imitation. A visual art should give the same superior shape to the temporal order that we expect of music. As with the twenty-six elements of the alphabet, music's hierarchical pattern of tones provide the model for visual art with which to "make infinite use of finite means" to construct "architecture."[1]

In this statement Whitney echoes Richter and Eggeling's call for a new audiovisual language based on the model of music. However, rather than simply appealing to the universal, absolute or temporality of music, Whitney, like McLaren is also interested in the movement and patterns associated with music. Whitney also makes clear the need for a new language and grammar to underpin his art but did not believe that the contemporary arts at the time were moving in a direction sufficient to this realisation. It was inevitable, therefore, that Whitney would abandon cinema as a tool for creating visual music.

With his visual music films Whitney was ostensibly attempting to create a new language.[2] This new language required a new vocabulary and a new grammar that spoke like music. There are, of course, problems creating a new grammar where none exists as basic assumptions need to be revised. Whitney considered existing cinema and animation process to be inadequate in the structure of this new language and proposed that computer graphics, with their underlying mathematical foundations, were the way forward. Whitney posited that his new art might function with all elements in motion at all times.[3] There was a burning question however over how to control these elements so that they would all contribute to a temporally structured whole.

Any visual art structured in time needs a generative building block and Whitney appropriated the computer graphic as the visual equivalent to the musical tone. The visual periodicity and harmonics of the computer graphic made it accessible to dynamic manipulation. In order to exploit these graphic tones Whitney had to once again find an instrument capable of engendering his theories of audiovisual harmony in the same way

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[1] John Whitney, *op. cit.*, p. 44-45.
[2] *ibid.*, p. 33.
[3] *ibid.*, p. 41.

that his pendulum instrument, however limited, could. For this end Whitney adopted the fledgling computer as the device that could orchestrate the flow of his complex patterns. As with his earlier films Whitney was resolute that the relationship of sight and sound would be best served if composed of a common aesthetic. As Whitney asserts:

> If one makes a very sensitive examination of music one realises it's oversimplifying it but one realises that the content is really motion. It's a matter of generating and resolving tensions by a process that's very much dynamic, a continuous matter of motion patterns, a kind of architecture of space and time.[4]

Here, Whitney is explicitly stating that he considers *motion* to be the common factor that allows the structure of music to be translated into moving images but in order for this concept to function Whitney is making the supposition that mathematical patterns function outside of music and can be applied in alternative contexts, in this case graphic pictorial forms. Whitney spent his creative career endeavouring to confirm that his hypothesis was viable and workable through his film work and research coining the term motion graphics and starting his motion graphics company *Motion Graphics Incorporated* creating title sequences for film and television such as the titles for Alfred Hitchcock's film *Vertigo* (1958) in collaboration with graphic designer Saul Bass. Whitney, however, never truly thought that he had fully demonstrated this thesis adequately and ultimately maintained the need for further expression through a larger body of work. To paraphrase Whitney, art is proved by art.[5]

Whitney speculated that this motion became pattern if the objects are moved differentially. This is ostensibly the same as tones in music becoming melody through a movement from one tone to the next. Emotion from music derives from force-fields of musical structuring in tension and motion. This is also true in the visual world when motion is introduced to elements.

Although Whitney has stated that the content of music is motion, in actuality it is a series of tones arranged into a pattern. Musical tones are the raw material of the structure of music. Whitney uses the computer pixel as his raw material to be sculpted temporally just as musical tones dance across time to create music. In order for Whitney to create the *motion* of music he is using a visual equivalent of the musical tone, in the case of *Permutations* and *Arabesque* the point, to create patterns, which are a constant state of motion. It is immediately clear that Whitney has borrowed from traditional pattern construction. In *Matrix III* (1972) he uses simple geometric figures of triangles and

[4] John Whitney, Interview, *The Screening Room: John Whitney*, 1972/2005, Robert Gardner,
[5] John Whitney, *op. cit.,* p 13.

hexagons but more interestingly he uses a series of points arranged into patterns resembling those found in Islamic art and the rose windows of the Gothic period in both *Arabesque* and *Permutations.* There is a precise harmonious geometry governing the distribution of constituent elements of Islamic designs and rose patterns and through the use of these structuring elements he is in one fell swoop making a visual connection between the origins of mathematics and geometry and his new *digital* approach.

A NEW TECHNOLOGY FOR A NEW ART

Whitney's vision for a new art, with a new language also required a new technology. In his programme notes for *Five Film Exercises*, which he prepared for the first Art in Cinema festival screening in 1946 Whitney predicts:

> Perhaps the abstract film can become the freest and the most significant art form of the cinema. But also, it will be the one most involved in machine technology, an art fundamentally related to the machine.[6]

Throughout his career Whitney was continuously striving to create a greater integration between technology and the creative process in order to fully realise his ambition to create visual music films that gave equal weight to both the musical and visual aspects. He continued to develop theories and technology publishing research papers in addition to working on newly evolving computer systems in order to achieve his creative ambitions.

Over the centuries, the keyboard and other musical instruments have been developed through co-operation between the fields of art and technology. Likewise, as demonstrated in chapter four, the means of composing visual music evolved through a similar co-operation. Visual music filmmakers engineered their own equipment and pioneered techniques to drive forward their distinctive approaches to representing or embodying music. It is no surprise then that Whitney began to collaborate with computer programmers and developers as part of an artist's residency at IBM in order to find the method most appropriate for embodying the visual music film predicated on the concept of mathematical harmony. As he writes: "Anyone experimenting with the medium of cinema as opposed to working in the industry is forced into a direct confrontation with his technology."[7]

Whitney was an accomplished engineer, designing and building his own equipment to create his idiosyncratic audiovisual imagery. As Moritz avers Whitney was technically

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[6] John Whitney, "Notes for Five Film Exercises," *Digital Harmony, op. cit.*, p. 144.
[7] John Whitney, Interview, Youngblood, *op. cit.*, p. 214.

astute enough to realise the possibilities of adapting the targeting elements in anti-aircraft guns to artistic ends during his time working at Lockheed Aircraft Factory during World War Two.[8] Whitney's first computer was an analogue system forged from an M5 anti-aircraft gun director that he later augmented with the M7 model. Despite his mechanical prowess, Whitney lacked computer programming skills and was forced to rely on others such as Dr. Jack Citron, a computer programmer at IBM, and computer animator Larry Cuba to undertake the task of programming for him.

Whitney began to collaborate with Citron before being the recipient of any formal IBM support. Citron wrote the original GRAF program that is derived from FORTRAN, the programming language initially developed by IBM in the fifties for engineering and scientific computing which also came to be used by composers such as Iannis Xenakis in their music compositions. Therefore, with Citron's adaptations both the FORTRAN and GRAF (Graphic Additions to FORTRAN) programs, with their basis in mathematics, could potentially be used to visual harmonic structure both visually and sonically, thus making them the perfect tool for visual music of 1:1 equivalency.

The GRAF program, controlled by punch cards, was based on a single polar-coordinate equation that had approximately sixty parameters. It had several steps to it. The first, a learning step, involved the use of a light pen to select numerical variables that were displayed on the CRT screen. These values were assigned to one of the parameters to produce a specific graphic pattern which is then recorded by a camera. The computer camera shutter modified by Whitney and his son John was operated electrically and controlled by the computer. Whitney used three types of punch cards during filming to control the images. These consisted of an identification statement that specified particular curves, a parameter statement that assigned values to the curves and frame statements that controlled successive displays. Essentially Whitney was feeding the computer the mathematical calculations that were required to create the constituent curves that formed the visual figures in his films so the images that are viewed on screen are the visual manifestations of mathematical calculations.

The GRAF program required direct human interaction with it in order to produce coherent animations. Whitney interacted with the computer through a Program Function Keyboard (PFKB) that was equipped with thirty six sets of key switches and lights. The

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[8] William Moritz, "Digital Harmony: The Life of John Whitney, Computer Animation Pioneer," August 1, 1997), http://www.awn.com/articles/people/digital-harmony-life-john-whitney-computer-animation-pioneer, [Accessed: September 10th 2010].

program would turn on a light as a signal for the camera shutter to open. Interface connections between the camera and computer included feedback circuits that allowed the computer to respond to computer commands in addition to allowing Whitney to use single frame exposure. When the second light was illuminated the shutter would close. Light three would turn on when the film frame needed to be advanced.

The black and white negative from the camera was processed on high contrast stock. This stock was threaded into the projector side of an optical printer so that the optical axis was vertical thus allowing the camera to look down into the projector. This projector was then mounted on an altered table that was fitted with mechanical translations and rotations. The camera could be moved along the axis. This process allowed for a certain amount of editing such as superimposition, scaling, temporal changes and backwards printing. This means that there was scope for a certain amount of direct creative and human involvement in the process so although this process is labelled *digital* it is not digital in the aesthetic sense that contemporary audiences have grown accustomed to seeing in work that is created, projected and/or viewed in a digital format.

Essentially Whitney was, with the use of this program attempting to find a visual equivalency for digital instrumentation through his research into computer technology writing:

> I have been using the computer as if it were a new kind of piano. Using the computer to generate a periodic visual action with a mind to reveal harmonic, juxtaposed against enharmonic phenomena. To create tensions and resolution and to form rhythmic structures out of ongoing repetitive and serial patterns. To create ordered variation of changes. To create harmonies in motion that the human eye might perceive and enjoy.[9]

He had predicted a change in prospect for music and therefore a search for new musical resource asserting that when appropriate instruments became available the composer would find a visual equivalent, not unlike what Stepanov and Benesh were doing for music with their dance visualisation systems, which have subsequently been adapted for a computer based context as technology has progressed.[10] This has been manifested in new electronic

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[9] John Whitney, "A Computer Art for the Video Picture Wall," *Experimental Animation: An Illustrated Anthology*, Robert Russett and Cecile Starr (Eds.), p. 189.

[10] See Rhonda Ryman, Baldev V. Singh, John C. Beatty and Kellogg S. Booth, "A Computerised Editor of Benesh Movement Notation" in *Dance Research Journal* Vol. 16, No., Spring, 1984, University of Illinois Press on behalf of Congress on Research in Dance, pp. 27-34, http://www.jstor.org/stable/1478255 and for further information about Stepanov notation see V.I. Stepanov, *Alphabet of Movements of the Human Body; a Study in Recording the Movements of the Human Body by Means of Musical Signs*, Raymond Lister (Trans. from French ed. of 1892), 1969, New York: Dance Horizons. For a thorough explanation of how to use the Benesh notion score see the Royal Academy of Dance notes. http://www.rad.org.uk/files/ART130_How%20BMN%20score%20works.pdf.

digital instruments such as the Tenori-On, a digital musical instrument with a visual interface consisting of a 16 x 16 matrix of LED lights that is the result of a collaboration of artist Toshio Iwai and Yamaha,[11] and generative I-Phone applications such as Brian Eno's *Bloom*, demonstrating the translation of these harmonic laws. *Bloom*, created in 2009, is the result of collaboration between ambient music composer Brian Eno and software engineer Peter Chilvers.[12] *Bloom* functions simultaneously as an instrument for composition, playback and visualisation. By touching the screen, the user produces a circular sonoluminescent image that resonates with a corresponding sound. When left idle the program generates infinite sounds and images that play off the user's initial physical input. Further to these examples, modern computer programs such as Ableton are capable of real-time processing that allows composers, visual music makers or VJs the capability to compose instantaneously. This gives them the ability to improvise or use the computer as an instrument rather than merely a compositional tool that requires playback in much the same fashion as Edison's phonograph did.

Whitney envisaged the possibility of a composer creating audiovisual composition using new compositional procedures. He writes:

> It is noted that computer graphic systems, like the microscope and telescope, can reveal a new world to our vision. This new world includes periodic mathematics which has now become directly visible. Here is the possibility for a new art form of pattern structured movement not unlike the structured pattern of music....It is proposed that my films deal in this domain of visualisation of periodic mathematical phenomena.[13]

It is clear from this statement that Whitney considered these new audiovisual graphic systems to be manifestations of mathematical harmony. Whitney fleetingly alludes to the benefits of digital instrumentation to the composer stating in an interview with Gene Youngblood in *Expanded Cinema* that his GRAF computer program that was developed during his time as artist in residence at IBM was "like a piano"[14] that he could use creatively throughout his life. Prior to the development of digital instruments composers required an interpreter for their compositions unlike visual artists or direct filmmakers who could lay their compositions directly onto or through the medium without an intermediary. With digital programmable instrumentation the composer can in effect be the player. With this program Whitney was eventually able to solve the problems that he had encountered

[11] Yamaha, 2009, http://tenori-on.yamaha-europe.com/uk.
[12] http://www.generativemusic.com/index.html
[13] John Whitney, "A Computer Art of the Video Picture Wall," *op. cit*., p. 187.
[14] John Whitney cited in Youngblood, *op. cit*., p. 207.

with real-time playback incurred while working with his early attempts at creating visual music.

Whitney used the GRAF system in *Permutations* (1966), his first digital film. Set to a tabla solo by Indian classical musician Sundaram Balachander, it contains similar images to those found in his brother's cosmic films such as dot patterns that radiate from a

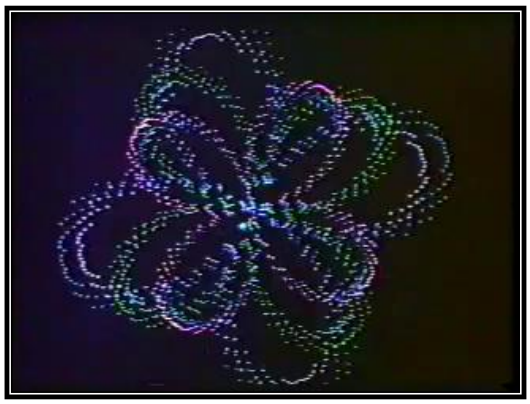

FIGURE 5.1: STILL IMAGE FROM JOHN WHITNEY, *PERMUTATIONS* (1966). HTTP://YOUTU.BE/BZB31MD4NMA.

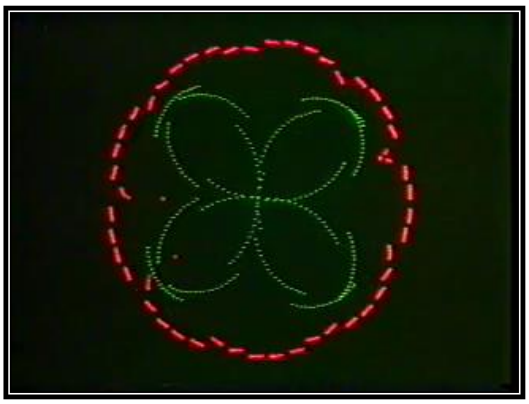

FIGURE 5.2: STILL IMAGE FROM JOHN WHITNEY, *PERMUTATIONS* (1966), *OP. CIT.*

central focal point. Whitney's dot patterns must be regarded as something different to those of his brother's. There is a different philosophy underlying John Whitney's work.

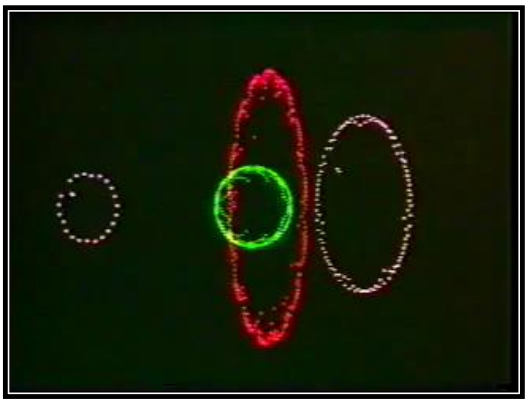

FIGURE 5.3: STILL IMAGE FROM JOHN WHITNEY, *PERMUTATIONS* (1966), *OP. CIT.*

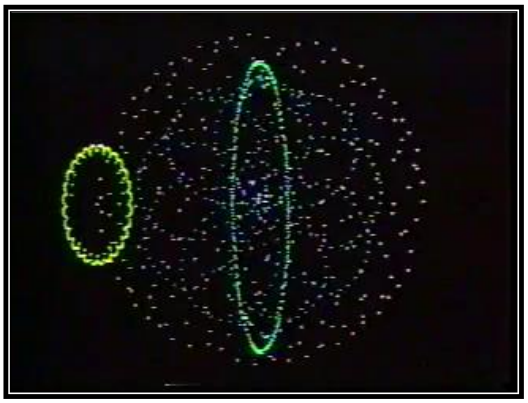

FIGURE 5.4: STILL IMAGE FROM JOHN WHITNEY, *PERMUTATIONS* (1966), *OP. CIT.*

Gene Youngblood draws attention to the "seriality of the composition"[15] and identifies the composition as a statement composed of distinct elements of words and sentences. This parallel with language is only partially correct. It is probably more apt to compare the sequences in *Permutations* to phrases in music, due to the seriality, temporality and polyphony of images. However, Whitney himself has stated that the dot patterns in the film could be compared to the alphabet and slotted contextually to form sentences.[16] One could say that in each sequence Whitney is exploring each permutation of forms within a

[15] Youngblood, *op. cit*., p. 218.
[16] John Whitney, Interview, Youngblood, *op. cit*., p. 215.

sentence/phrase in a formal and scientific manner, not moving onto the next one until all possible outcomes have been explored, just as the twelve tone composers were exhausting all twelve notes of the tone row before moving on within a musical composition. In many ways the rigorousness of this approach has its roots in Richter's strict rules of counterpoint and harmony that were employed in *Rhythmus 21*.

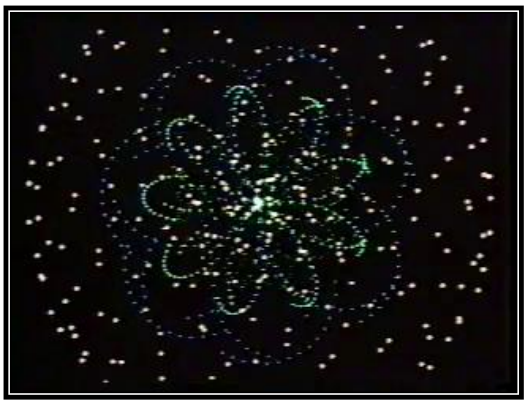

FIGURE 5.5: STILL IMAGE FROM JOHN WHITNEY, *PERMUTATIONS* (1966), *OP. CIT.*

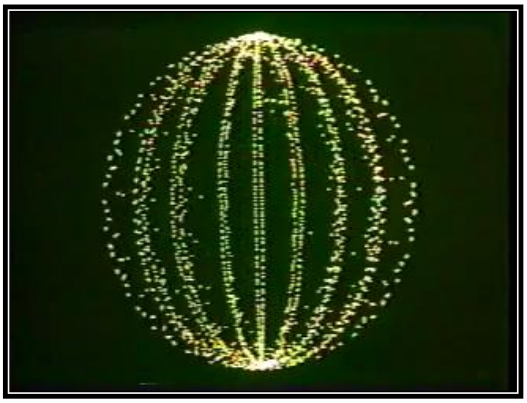

FIGURE 5.6: STILL IMAGE FROM JOHN WHITNEY, *PERMUTATIONS* (1966), *OP. CIT.*

Rather than using the dot formations as an aid to meditation or to expand the viewer/listener's consciousness as James did, John Whitney was instead making the same connection that the Pythagoreans did between number, music and the cosmos. This means that his films, although making universal connections between the microcosm and macrocosm like his brother's, are at heart rational rather than mystical entities. The jittering dot formations resolve into mandalas, swirling galaxies full of infinitesimal particles, flowers and geometric patterns gleaned from Islamic art yet they also utilise algebraic curves derived from differential geometry that reference the golden triangle and the cardioid patterns of sound waves.

Unlike the constant undulating flow and diffusion of his brother's work the dot patterns in *Permutations* flash rhythmically in time to the beat of Balachander's drum. Keeping in line with Whitney's intentions for his new art form posited above, each particle on screen is in motion at all times. Whitney makes overt musical references introducing polyphony early on in the film. The various permutations of dot patterns that appear on screen maintain separate and independent existence on screen just like the melodic lines in music that integrate to create a polyphonic structure. Within this structure dot patterns enter and exit from off screen interacting with each other in the centre of the screen just as musical instruments come and go throughout orchestral compositions.

Matrix III, takes this Pythagorean connection between mathematics, music and the cosmos even further. The film opens with a long lingering static image of a layered red and white triangle; presumably this is a direct reference to the sacred Pythagorean figure of tetractys to make the connection clear. The very title of the film makes bold this link. The term *matrix* carries multiple meanings just as the term harmony does. Derived from the late English term *womb*, at its most basic level it refers to the environment from which something evolves or develops. In mathematical terms it refers to "a rectangular array of quantities or expressions in rows and columns that is treated as a single entity and manipulated according to particular rules."[17] The forms in *Matrix III* take this definition at its most literal sense, geometric forms snake along mathematically precise paths (see figure 5.7 and figure 5.8).

FIGURE 5.7: STILL IMAGE FROM JOHN WHITNEY, *MATRIX III* (1972). HTTP://YOUTU.BE/ZRKGYY5ADVA.

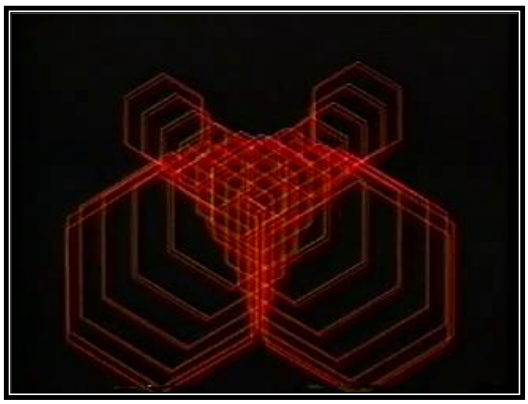

FIGURE 5.8: STILL IMAGE FROM JOHN WHITNEY, *MATRIX III* (1972), *OP. CIT.*

The movements of the figures in *Matrix III* is extremely controlled yet Whitney introduces tension into the movement by contrasting it with moment of release, where the figure seems to slow and almost rest at the end of a phrase. It is like watching a practitioner of Tai-Chi perform a sequence of movements or a ballet dancer prepare for a leap across stage or finish a movement in a pose.

Matrix III is synchronised to a section of "A Rainbow in Curved Air" (1968) by American minimalist composer Terry Riley. Riley's improvised composition for solo keyboard was inspired by Karnatak South Indian music. Describing the form of the composition, Allison Welch writes:

> The germinal musical idea for "A Rainbow in Curved Air" in an arpeggiated pattern that appears in quickly moving, even rhythmic values in the bass

[17] "matrix noun" Oxford *Dictionary of English*, Angus Stevenson (Ed.), Oxford University Press, 2010, Oxford Reference Online, Oxford University Press, http://www.oxfordreference.com/views/ENTRY.html?subview=Main&entry=t140.e0505110, [Accessed: June 1st 2011].

throughout most of the piece, giving the effect of a seven beat cyclic tala pattern, which Riley has identified as Rupak tala.[18]

The piece has a cyclic bass that is overlaid with melodic variations. For example there is often a variation in the rhythm, with it doubling or halving in tempo at certain points. Whitney also introduces equivalent rhythmic permutations in the speed of the visual patterns. Riley's rapid arpeggios are often subjected to *time-lag technique* which has a counterpart in the lagging streams of images in Whitney's visuals. As Whitney sets a geometric figure along an assigned mathematical path, it leaves a trail of afterimages in its wake (see figure 5.9). Welch posits that Riley's use of the time-lag technique results in a total effect that is "harmonically static but rhythmically energised."[19] This assertion could be equally applied to *Permutations* and *Matrix III*. Whitney creates tension and energy in the composition of these films by varying the rhythm of the patterns and quality of the movements.

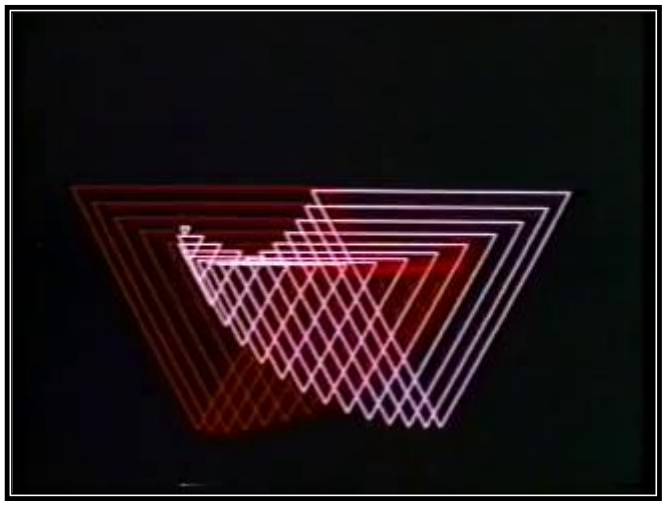

FIGURE 5.9: STILL IMAGE FROM JOHN WHITNEY, *MATRIX III* (1972), *OP. CIT.*

Although Whitney did not compose the music himself for *Matrix III* and the music does not share the same mathematical source as the visual graphic forms, they both integrate to form a larger audiovisual structure with the music and visuals serving as independent voices just as they do in *Permutations*. Rather than maintaining perfect synchronisation between the music and visual patterns throughout the film, Whitney is attempting something far more sophisticated and often juxtaposes the rhythm of the images with the rhythm and drone of the organ, the speed of the graphic patterns changing even when the music does not. At other times the sound and image are working in counterpoint,

[18] Allison Welch, "Meeting Along the Edge: Svara and Tala in American Minimal Music," *American Music Vol. 17, No. 2,* Summer, 1999, University of Illinois Press, p. 187.

[19] *ibid.*

making Riley's music and Whitney's visuals seem more layered. This is quite unusual in terms of the films that have been discussed in this thesis. Many of them do possess the *third quality* so desired in the Gesamtkunstwerk of visual music but none of them quite integrate or play on Chion's ideas of *dissonant harmony* between the image and soundtracks in such a knowing and sophisticated manner.

HARMONIC MOTION IN ARABESQUE

Whitney used the principle of harmonic motion as the structuring elements in his digital films. Simple harmonic motion can be described as the:

> repetitive movement back and forth through an equilibrium, or central, position, so that the maximum displacement on one side of this position is equal to the maximum displacement on the other side. The time interval of each complete vibration is the same, and the force responsible for the motion is always directed toward the equilibrium position and is directly proportional to the distance from it.[20]

This harmonic motion is exhibited by many physical systems such as vibrating sound waves or swinging pendulums. Whitney's use of this differential motion pattern has a counterpart in the simple harmonic or sinusoidal motion in sound tones. This is one of the reasons for the correlation between the patterns of motion present in Whitney's film and Xenakis' visualisation of the complex sounds used in his musical pieces. An exemplar of this application of simple harmonic motion can be evidenced in Steve Reich's composition "Pendulum Music," which I referred to in the previous chapter. The microphone pendulum, which swings in between two speakers, generates particular rhythmic patterns and tones through the effect of harmonic motion, which is acting as a time keeper or natural metronome.

Simple harmonic motion is frequently visualised as the "projection of uniform circular motion onto an axis"[21] This projection can be represented as the projection on a vertical axis (y axis) of the point P moving around a circle at a uniform rate (see figure 5.10).

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[20] "simple harmonic motion**,"** *Encyclopædia Britannica*, 2010, Encyclopædia Britannica Online, http://www.britannica.com/EBchecked/topic/545322/simple-harmonic-motion.

[21] Thomas D. Rossing, Paul Wheeler and Richard Moore, *The Science of Sound, 3rd Edition*, 2002, Addison Wesley, p. 151.

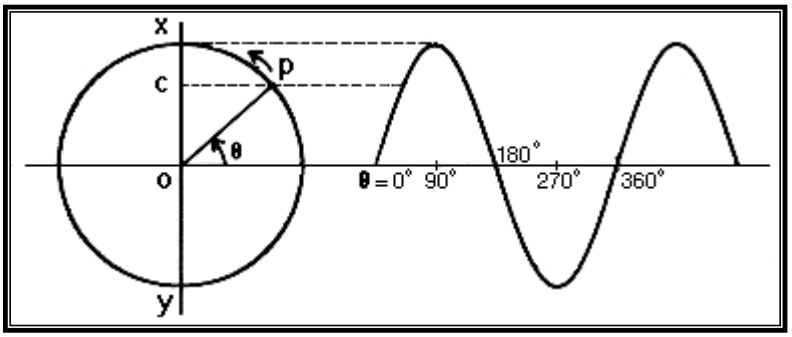

FIGURE 5.10: THE REPRESENTATION OF SIMPLE HARMONIC MOTION AS THE PROJECTION OF CIRCULAR MOTION FROM BARRY TRUAX (ED.), *HANDBOOK FOR ACOUSTIC ECOLOGY 2ND EDITION*, 1999, WORLD SOUNDSCAPE PROJECT, SIMON FRASER UNIVERSITY, AND ARC PUBLICATIONS, HTTP://WWW.SFU.CA/SONIC-STUDIO/HANDBOOK/SIMPLE_HARMONIC_MOTION.HTML.

At the circle rotates, the projection of point P on the vertical axis moves in simple harmonic motion with the angle ø indicating the distance that the circle has turned. As ø increases, P (the corresponding point) moves to the right on the graphic, a distance of T on the time axis. This demonstrates displacement versus time. In one revolution, ø increases by 360 degrees. The complete description of a given simple harmonic motion requires three parameters: the period (frequency), the amplitude, and the initial phase. There is tension and resolution in this motion just as there is in music.

Arabesque, John Whitney's 1975 graphic film is the culmination of many of his theories and ideas on the interrelationship of sound and vision. While not his first cohesive film to be produced following his transition from analogue computer to digital computer (*Permutations* holds that honour), it is perhaps, his most fully realised culmination of many of theories and ideas on the interrelationship of sound and vision. Moreover its importance as a transitional film in the canon of the visual music film cannot be underestimated. Whitney was heavily influenced by Islamic ideas of harmony between the seemingly disparate ideas of music, geometry, architecture design and the cosmos and took geometry and design of the arabesque as crux of the film. An arabesque is a style of decoration characterised by intertwining abstract formalist curvilinear motifs. The arabesque has been an essential part of the decorative tradition of Islamic cultures since 1000AD.

Although this harmonic motion is present in all of Whitney's digital films it is especially important to the structure of *Arabesque*. *The* structure of *Arabesque* is based on a simple graphic array of basic repeating elements. An array of 360 points numbered 1 to 360 is distributed around a circle. They move according to an algorithm that moves all 360 points in one direction, horizontally to the right. It is this differential rightward motion that governs all 360 of the points throughout the film and functions in much the same fashion as a motif in musical composition. In a television interview in 1972 Whitney described in

layman's terms how his application of the differential dynamics of harmonic motion worked. Whitney started in the middle of the picture and moved out a few degrees of distance from this central point and placed another point. This continues until there are 280 points. This makes a single frame that is then photographed by the camera before advancing to the next frame. Again, this demonstrates a correlation with Xenakis' description of a complex sound. Moreover, Whitney is structuring the melody of the individual elements into an indivisible structured totality in much the same way that Xenakis does with his clouds of glissandi in "Metastaesis," albeit a more graphic totality than Xenakis' diffuse formations.

Each successive frame throws the composer an entirely new batch of numbers to deal with that could appear as just random dots but due to Whitney's use of differential dynamics these dots fall into harmonic relationships with each other at certain points, forming floral patterns and rose curves. It is this simple harmony that allows Whitney to make the connection between the visual and aural worlds in order to build audiovisual compositions from a common base.

> …this [harmony] is the thing I discovered really in making this film and became very much interested in extending and I was attracted to it primarily because this harmonic phenomenon has many similarities and kinships to the phenomenon that is the, really is at the root of the foundation of music, the organisation of music.[1]

He structured the melody of the individual elements into an indivisible structured totality in much the same way that Xenakis does with his clouds of glissandi in "Metastaesis."

In addition to Pythagoreanism I can discern two Western influences present in the structure of John Whitney's digital films. The first is the rigorous mathematical structure of twelve-tone serial composition and the second is Baroque music and mathematics. One would assume that detection of a Baroque sensibility in Whitney's work would be a purely musical one but in fact I would posit that it is the Baroque conception of space, mathematics and dualism (coupled with differential dynamics) that holds perhaps stronger sway over the structure of the film.

In the serial form developed by Arnold Schoenberg and his Viennese school in the 1920s the twelve notes of the chromatic scale are arranged into a twelve tone row; an arbitrary series in which all twelve notes are utilised and no single note is elevated to prominence over the others. This twelve-tone row therefore becomes the foundation for melody, counterpoint and harmony. This eschews the privileged position of the tonic key

[1] John Whitney, Interview, *The Screening Room*, *op. cit.*

that had underpinned music since the late Renaissance leading to an atonalism of sound. In addition, this serial arrangement shuns traditional harmonic concepts of consonance and dissonance.

Serialism is essentially a numbers game. It is no accident that its main practitioners were inordinately concerned with mathematics and numbers. Milton Babbitt was initially studying for a mathematics degree before instead deciding to study music. Iannis Xenakis was a mathematician and engineer before turning to musical composition. Schoenberg's interest in mathematics was almost mystical. Schoenberg believed in the divine power of number. The twelve tones that made up the chromatic scale were of great importance to him as the two digits added together make three, the triad which to Pythagoreans and those of a spiritual bent was the perfect number symbolising beginning, middle and end, the union of one and two and odd and even. Numerological symbolism can also be discerned in Schoenberg's opera "Moses und Aron."

Whitney had been instructed in some of the basic principles of Schoenberg's twelve-tone serial composition while studying with Schoenberg's disciple Leibowitz in Paris. Whitney's concept of the tone row, subjected to transpositions, inversions and retrogressions, seemed readily adaptable to a film sequence. Figuratively the tone row could be mapped onto the filmstrip. Image sequences seem well suited to this idea but using the same variations in images does not have the same effect as shifting harmonic forces. As Whitney states, "... no visual motion worked the way musical motion works."[2] Yet, Whitney soon became obsessed with the art of music; rhythm and harmony, why twelve tones could infinitely be recycled. He began to explore ideas of creating comparable structures of visual pattern and tried to adapt the concept of the tone row to the film strip. Whitney made attempts at using serial permutations of imagery in *Permutations* but this is not to say that he tried to serially compose with visual images in the same fashion as Schoenberg or the serial composers did but he has made reference to Schoenberg's use of harmony. Many people mistakenly think that serial composition abandons harmony altogether but Whitney considered Schoenberg to be merely reasserting harmony outside of established music conventions. This idea of formulating new concepts of harmony is something that Whitney attempts in his film work. His films did not explicitly parallel the serial composers reimagining of harmony exactly but there is a similarly ordered harmonic spirit at work in all of Whitney's films. What he does seem to have recognised was that a series of patterns could be systematically produced and

[2] John Whitney, *op. cit.,* p. 26.

reproduced with various permutations, which is what he was exploiting with the serial dot patterns in *Permutations*.

There is a noticeable link between Whitney's digital work and the Baroque. After reading earlier chapters of this thesis one could speculate that this association exists predominantly between Whitney's film *Arabesque* specifically and Baroque music, particularly that of J.S. Bach. However another important connection can be made between the visual structure of *Arabesque* and Baroque architecture and mathematics. Links have been made between the *digital* and the Baroque prior to this but not in such a literal way and not, to my knowledge, with the work of Whitney. In his book *Digital Baroque: New Media Art and Cinematic Folds*, Timothy Murray examines the relationship between the digital and the Baroque in new media but through a psychophilosophical approach that draws heavily on Deleuze's theories of the Baroque fold and cinema. Similarly, André Bazin drew attention to the relationship between the Baroque and cinema in his collection of essays, *What is Cinema?*[3]

It is difficult to begin writing about the Baroque, as there is an abundance of arguments as to what exactly the term *Baroque* encompasses. There has been much confusion surrounding the Baroque with questions arising over whether it is a period, a style or a quality. For the purposes of this thesis the Baroque will be taken to be the period roughly 1590-1700. The term Baroque was not actually used during this period but first came to be applied retrospectively by academics such as Swiss art historian Heinrich Wölfflin in his arguably most famous works *The Renaissance and Baroque*, published in 1888.

The term was first used in a derogatory fashion in eighteenth century criticism and came to be associated with what was then seen as the grotesque and overly decorated expressionistic tendencies of the seventeenth century. The very term *Baroque* derives from Portuguese term *barroco*, which was used to describe an irregularly shaped pearl. It came to be rehabilitated through the art criticism of Jacob Burckhardt and Karl Baedeker in the nineteenth century. As music historian Claude C. Palisca asserts the term only came to be applied to music in the 1940s and 1950s to describe a style of music that could be considered to be characteristic of that period. He further suggests that the use of the term implies that historians believe that the qualities of this music are related to those of

[3] André Bazin, "The Ontology of the Photographic Image," *What is Cinema?* Hugh Gray (Trans.), 1967, Berkeley: University of California Press, pp. 9-16.

contemporary architecture, painting, literature, and science and philosophy.[4] For the purposes of this thesis I am inclined to concur with Palisca's use of the term as a period rather than a style designation so that semantic arguments may be avoided and in order to further reinforce the fluidity of boundaries between the arts, life and philosophy during this period that can be extended to include John Whitney's pursuit of an ideal visual music.

At the end of the sixteenth century there was a drive for systemisation that started in Rome on the back of the Counter Reformation. In some ways the birth of the Baroque in Italy under the patronage of the Catholic Church allowed the Church to re-assert itself as a significant power following the devastation inflicted as a consequence of the Reformation. Ultimately though, the period was marked by a greater desire for security in the face of too much choice and diversity during the Renaissance period. The Baroque period tried to reduce this element of choice by introducing hierarchical systems. Mathematics and geometry became the tool most appropriate for people living during the Baroque period to understand the world.

Jim Henle states that the Baroque period and its new means of expression developed the corresponding mathematical language of algebra.[5] The common element in mathematics prior to this had been geometry. During the Baroque period Descartes (1596 - 1650) and Fermat (1601 – 65) discovered that geometric forms could be expressed algebraically. Henle posits that this was a massive leap forward in the fields of mathematics.[6] Another feature of the Baroque period that made its way into both music and mathematics and, as demonstrated earlier in this chapter, the digital films of John Whitney was a seemingly "incompatible tendency"[7] between precision and emotional intensity. This dualism that occurred in the mathematics was expressed in the tension between the discipline of geometry and the freedom of algebra to express more abstract ideas and concepts is manifested in the films of Whitney, which employs both mathematical concepts allowing his films to be at once precise and mathematical but still retain emotional expression.

The period of the Baroque was also characterised by increased exploration, colonisation, and scientific research, radiating out from Europe. There was a growing specialisation with an emphasis on the Platonic ideal of one man, one job and there was a split in unity between art and science. The Baroque environment was ordered by a system

[4] Grout and Palisca, p. 346.

[5] Jim Henle, "Classical Mathematics," *The American Mathematical Monthly*, Vol. 103, No.1, January 2006, pp. 18-29.

[6] *ibid.*

[7] *ibid.*, p. 20.

built on centralised hierarchies radiating out from a fixed point. In contrast to the closed static Renaissance systems, extensions radiated out from dominant centrally located foci. In the case of the Baroque city this consisted of a focal point such as monument, a building of great importance such as a palace or cathedral or a square, which were interconnected by streets that extended out from this point. As Christian Norberg-Schulz states, "In relation to this focus, man's existence became meaningful, spatially expressed through a system of possible movements, or "paths," which converge on the centre."[8] Yet as he also points out in *Baroque Architecture*, even though the foci may be dominant and central, the single building in the Baroque city loses its individuality to become part of a superior system.[9] This idea can be extended to Whitney's points in *Arabesque* which are animated to rotate around a central point with every point contributing to a whole. Each element is in constant motion, moving and resolving itself into curvilinear shapes that rotate around a central point. There is also a rhythm to the distribution of elements of patterns that can be likened to the distribution of columns in Baroque architecture.

So far, this chapter has looked at the influence that serial composition had on John Whitney in terms of a reimagining of harmony, in addition to thinking about serial variations of the twelve-tone row in figurative terms. However, in spite of this *Arabesque*, I proffer, has more in common with the aesthetics of Bach's absolute music than that of Schoenberg's twelve-tone system.

Bach's musical work is renowned for its dual features of "numerical perfection and profound spirituality."[10] Leibniz defined music as "the hidden arithmetical exercise of a soul unconscious that it is calculating."[11] This statement could almost be describing Bach's work. It certainly serves to create a link between the philosophies of Bach and Gottfried Leibniz, a rationalist philosopher, mathematician and logician during the Baroque period. In his classic text on Bach, Wilfred Mellers draws a connection between Bach's work and Leibniz describing the musical mathematics in his works as an exercise in the dialectical logic of Leibniz or Spinoza"[12] and theorises:

> The theologians, philosophers, alchemists, and music theorists whom Bach read encouraged an equation between mysticism, magic, and number, absorbed from Greek and Oriental sources, from scholastic philosophy and, in pseudo-scientific form, from the metaphysicians of the then present. Such concepts

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[8] Christian Norberg-Schulz, *Baroque Architecture*, 1979, Milan: Faber and Faber/Electra, p. 10.
[9] Norberg-Schulz, *op. cit.*, p. 97.
[10] Jamie James, *op. cit.*, p. 180.
[11] Leibniz cited in *Contemplating Music: Source Readings in the Aesthetics of Music, Volume 3: Essence*, Ruth Katz and Carl Dahlhaus, 1992, New York: Pendragon Press, p. 247.
[12] Wilfred Mellers, *Bach and the Dance of God*,1981, New York.

> exerted an increasing influence on Bach. As rational Enlightenment encroached, Bach ballasted his faith with hermetic truths that could be demonstrated, in terms of music, with an exactitude that leaves verbal language helpless...[13]

This statement embodies Bach's attempt to use the mathematical logic of his music to embody the entire cosmos. Although Bach's musical compositions are considered to be quintessential examples of absolute music, functioning on a purely formal level, they are also capable of operating on a spiritual level simultaneously.

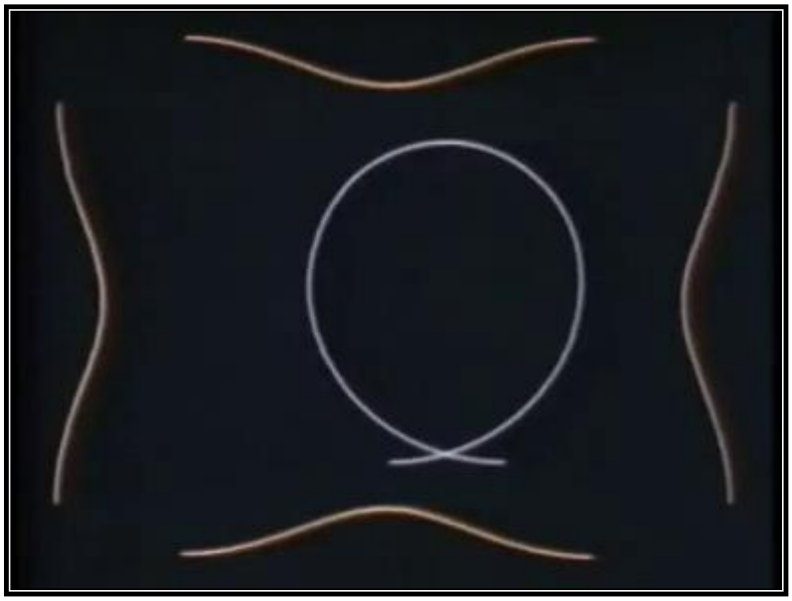

FIGURE 5.11: IMAGE FROM JOHN WHITNEY, *ARABESQUE* (1975), HTTP://YOUTU.BE/HNLQA74H7IS DEMONSTRATING THE TYPE OF IMAGERY EMPLOYED IN THE FILM.

Whitney uses many devices that are characteristic of Baroque music within the structure of *Arabesque.* J.S Bach's Baroque music as we have seen, in contrast to that of the serialists, uses a definite tonal system, which allows for modulation from one key centre to another. This functions primarily as a device for a formal arrangement. Bach's conjunction of counterpoint with homophonic style results in a hybrid that employs a figured bass (homophony) as a foundation for two or more independent melodic lines (polyphony). It is this tonal system that is more visible in *Arabesque* than Schoenberg's.

Compositionally *Arabesque* can be divided into seven movements. These movements are discrete but use the form of the arabesque to link the sections and lend coherence to proceedings. The film begins with a circle of 360 points moving rightwards in a demonstration of simple harmonic motion. This functions like a musical figure that is constantly reiterated with variations. For example in the first section on completion of the

[13] *ibid.*

opening circular dot figure, it is repeated but the action is reversed. These reversed actions are achieved by mirroring the image, in other words switching the polarity of the x and y co-ordinates. Whitney repeats this figure with variation throughout the film but it is still recognisable as the original circular figure (see figure 5.10). The principle of theme and variation was a pervasive feature of seventeenth century instrumental music and although a favourite of Renaissance keyboard music it became a feature of the Baroque repertoire. The melody could be repeated with little or no change with each melody being ornamented differently for each variation with the underlying harmonies typically remaining unchanged. In Baroque music it is the bass of the musical composition that remains constant not the melody.

Palisca describes the music of that period as acknowledging stylistic differences between older and newer practices but despite encompassing a wide range of styles, certain musical features remained constant during the Baroque period. Firstly, as we have seen there was a move toward a greater systemisation and more defined structure during the Baroque period and there remained a clear distinction between various styles of composition with each regarded as distinct with their own social function and technical characteristics. Writing during this period became more idiomatic with composers writing for particular instruments and incorporating affectation and ornamentation into their music as composers had struggled to find "musical means for the expression of affections or states of the soul…."[14] A vocabulary of devices emerged to convey these states.

As Chapter One revealed, absolute instrumental music gradually became the equal of vocal music at the beginning of the seventeenth century. However, as Palisca points out instrumental music was far from being standardised. Certain general types of composition such as the fugue and canzone, which are based on the principle of counterpoint, emerged during the period and have come to be intimately associated with the Baroque. Bach in particular came to be connected with the fugue.

Counterpoint, a device carried over from the Renaissance period continued to be the foremost basis of composition during the Baroque period. This device is the cornerstone of many visual music compositions that this thesis has examined. It is the main structuring element in Richter and Eggeling's visual music work and is also evident in Fischinger's film *Kreise* and much of McLaren's work. Whitney uses counterpoint extensively in *Arabesque*. An exemplary instance of this is in section six which uses a form of counterpoint referred to as a *canon*. A canon is the most exact form of imitative

[14] Grout and Palisca, *op. cit.*, p. 351

counterpoint.[15] Each constituent part is identical but they begin one after the other. This can be seen in section/movement six, which begins with a canon based on the first circular (arabesque) image presented at beginning of the film. On completion of its motion path it holds its position as another image begins, but this time the figure is rotated at an angle of seventy two degrees clockwise. In total five of these rotated figures appear forming a pentagram, an icon derived from Islamic art (see figure 5.12 and figure 5.13). This pentagram rotates before the assembly action is reversed resulting in the form being deconstructed. This reversal of the sequence is akin to the inversion of the twelve-tone row in serial composition.

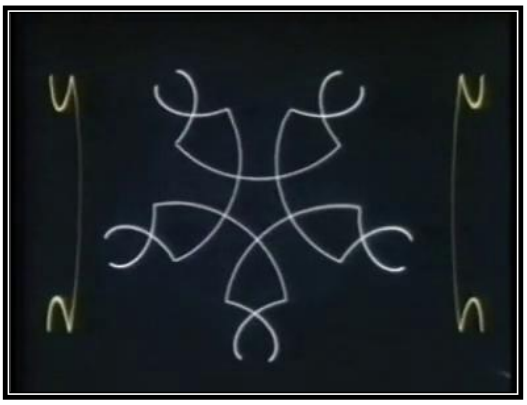

FIGURE 5.12: IMAGE FROM JOHN WHITNEY, *ARABESQUE* (1975), *OP. CIT.* DEMONSTRATING THE FIGURE OF A PENTAGRAM.

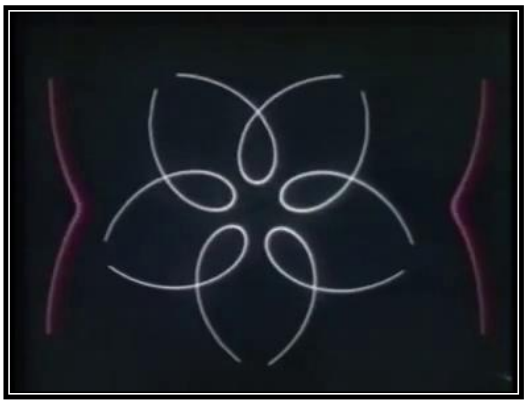

FIGURE 5.13: IMAGE FROM JOHN WHITNEY, *ARABESQUE* (1975), *OP. CIT.* DEMONSTRATING THE FIGURE OF A PENTAGRAM.

Another prominent feature of Baroque music is the use of figured or thorough bass. With the exception of compositions written for solo performer, most Baroque compositions came to include a part for a *continuo* instrument such as a harpsichord, clavier or organ that was usually reinforced by a sustaining instrument such as a bassoon. The continuo instrument would construct a harmonic accompaniment for the other instruments based on the bass line indicated on the score. This figured bass varied according to both the nature of the composition and the skill of the player, allowing room for improvisation within a given performance. The best analogy for this can be seen in jazz piano, particularly the Boogie-Woogie style of playing, in which the pianist will improvise a melody over a steady syncopated figured bass.

In addition to the figured bass, Bach also used the device of the cadenza in order to introduce further improvisation and ornamentation into his compositions. His cadenza for harpsichord towards the end of the first movement of the "Brandenburg Concerto No. 5 in

[15] "Counterpoint is the coherent combination of distinct melodic lines in music, and the quality that best fulfils the aesthetic principle of unity in diversity," "Counterpoint," *The Oxford Dictionary of Music*, 2nd ed. rev., Michael Kennedy (Ed.), Oxford Music Online, http://www.oxfordmusiconline.com/subscriber/article/opr/t237/e2498, [Accessed: June 1st 2011].

D major, BWV 1050" (1721) allows the player to display his virtuoso musical skills. However, cadenza need not necessarily be improvised as in the case of Whitney who employs this device in *Arabesque*. In section seven, towards the end of the film, Whitney introduces a textured and dynamic flourish in the guise of variations of recurring action played in canon against themselves (see figure 5.14).

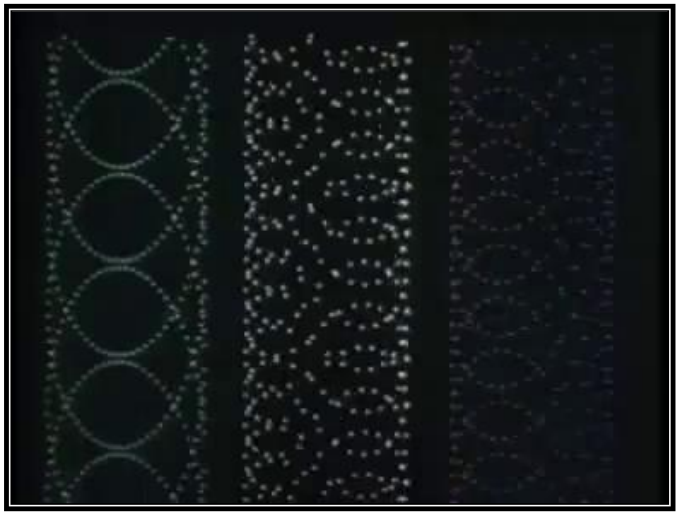

FIGURE 5.14: IMAGE FROM JOHN WHITNEY, *ARABESQUE* (1975), *OP. CIT.* DEMONSTRATING VISUAL POLYPHONY.

As mentioned previously, the Baroque period is marked by a move towards systemisation and syntheses. Until the works of architect Francesco Borromini, space had been understood as an abstract relationship between the physical elements that constituted the structure of an architectural form.[16] The need for a more expressive intensity during the Early Baroque, however, resulted in a richer ornamentation in the structure and decoration of buildings. Borromini, however, broke with this thesis, introducing space as a constituent element of his designs so that it became something concrete rather than a mere abstract entity. This idea of space having a concrete identity has a parallel in his contemporary Leibniz's development of *binary* system. This system is the most basic arithmetic notation. Rather than the choice of ten characters for each place in the decimal system the binary system uses only two; the character of one to denote a place that is filled and the character of zero to denote one that is empty.

0	1	2	3	4	5	6	7	8	9	Etc.
0	1	10	11	100	101	110	111	1000	1001	Etc.

TABLE 5.1: EXAMPLE OF BINARY CODE

Although Leibniz did little with his discovery of this system, failing to develop it into a full logical/mathematical system, it became the basis of modern computers and the

[16] Norberg-Schulz, *op. cit.,* p. 97.

digital system. Leibniz's binary system also had a metaphysical aspect to it. Leibniz believed that the entire universe could be constructed from numbers just as the Pythagoreans believed that number was a reflection of nature and vice versa. Drawing on the Pythagorean idea of a harmonious universe based on mathematical ratios Leibniz further rationalised this idea into a system of binary opposition. Leibniz speculated that if the entirety of arithmetic could be derived from the characters 0 and 1, then the entire universe could be generated from the same binary system of God and nothingness.

This idea of binary opposition exists in Borromini's architectural spaces. They become complex totalities in the same way that the music of Ligeti and Xenakis becomes a sonorous totality but the space also becomes a compositional entity by virtue of its absence. The complex physical geometries of his buildings are defined in opposition to abstract nothingness. Therefore, on another metaphysical level, Whitney and Xenakis' digital compositions also have an affinity with Borromini's use of space in their orchestration of the plastic elements in their respective digital mediums. Whitney and Xenakis' digital compositions, by virtue of being generated from binary code are natural bedfellows with Leibniz's binary system. The digital signal is predicated on a system of opposition. It can either be on or off, one or zero. In sound recording, for example, if a recorded sound level were to peak (exceed the decibel threshold levels) on a digital recording system the sine wave of the sound would literally be clipped at that point.

This idea of the divinity of the binary system was, as established earlier in this thesis, the governing force that drove the early absolute visual music films of Eggeling and Richter in their use of counterpoint. Recalling an earlier chapter, Richter asserted that in counterpoint he and Eggeling found a principle which fitted their philosophy of every action producing a corresponding reaction.[17] This use of binary oppositions as an "expression of life itself" is evident in Richter's film *Rhythmus 21,* where there is binary arrangement of black and white squares, moving in counterpoint with each other. As I drew attention to in chapter one, Richter appropriates the black and white squares of the film from the paintings of Kazimir Malevich. With paintings such as "White Square" Malevich reduces art to its most primitive absolute form. Branislav Jakovlievic asserts, however, the Suprematist "annihilation of the object' does not result in a universal nothingness, but in an all-encompassing unity. Malevich's 'nothing' is the nothing of fullness, not of emptiness.[18] He also speculates that this is in line with the Platonic idea

[17] Hans Richter cited in Lawder, *op. cit.*, p. 43.
[18] Jakovlievic, *op. cit.*

from Parmenides that "the one is all things, and also nothing, both in relation to itself and to other things."[19] With the checkerboard pattern of his painting "Four Squares," Malevich presents the metaphysical emptiness of black and the fullness of white as binary oppositions just as Leibniz recognised the same concept in the numbers one and zero and more importantly just as Whitney makes the same connection through his requisition of binary code as the generative source of his digital films. Whitney's creation of an absolute visual music predicated on binary code makes a link with the early pioneers of the form but brings it firmly into line with contemporary processes.

Although it is perhaps not the most obviously striking aspect of *Arabesque* colour is still a notable presence in the film and deserves to be addressed. Music has always enjoyed an easier relationship with the machine than the visual arts. From the development of the keyboard to newer electronic instruments like the Theremin or Russolo's noise makers, musicians have always seemed ready to embrace whatever means necessary to produce musical sounds, readily incorporating new technology into their practice. This may of course be due to the fact that music is created from tones that can be defined according to mathematical ratios as opposed to colour or forms, which are less readily defined. As Whitney points out sounds retain separate identities, whereas colours do not.[20] Joseph Albers also makes note of this in his book *Interaction of Colour*. He maintains that a melody will retain its own character in any performance due to the ratio of its tones.[21] Intervallic relationships in colour are harder to maintain when transposed or blended.[22] Because of the readiness of musicians to open themselves up to whatever technology is necessary to produce whatever tones that they consider necessary to their art it is no surprise that visual music filmmakers were quick to embrace the computer as a compositional device.

Although I earlier stated that one of the reasons that musicians were quicker to embrace new technology and instruments than practitioners of the visual arts was due to the absolute nature of tonal relationships, I do not wish to dismiss the importance of colour to the visual music makers, who straddle the worlds of musical and visual arts. This thesis has thus far demonstrated that the relationship between colour and sound was intrinsic to the way that visual music has been understood. While I maintain that the relationship between colour and sound in the visual music is essentially aleatory or symbolic rather

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[19] Harley, *op. cit.*, p. 39.
[20] John Whitney, *op. cit.*, p. 89.
[21] Josef Albers, *Interaction of Colour* (Revised and Expanded Edition), 2006, Yale University Press, p. 34.
[22] *ibid.*

than synaesthetic this does not mean that colour was not important as a dynamic force in the visual music film.

Earlier in their visual music career, the Whitney brothers demonstrated a preoccupation with the role of colour in the visual music film. An essay written by the brothers in 1944, around the time they were working on their *Five Film Exercises* emphasises the importance of colour to the "total sensory experience"[23] of the visual music film, stressing that colour structure must be married with a "graphic-time structure"[24] so that the two contribute to a unified whole. They also made the comparison between this unified colour-graphic-time structure to the orchestration and theme structure of a musical composition.[25] They were clearly still labouring under the influence of the visual music films that they were being exposed to at the Art in Cinema screenings. John's conception of visual music evolved from this synaesthetic philosophy to one reliant on mathematical harmony. In his paper "A Computer Art for the Video Picture Wall" he refuted the assumption that people have made in regard to his digital visual music that he was comparing the audio spectrum to the colour spectrum[26] stating that what his work had in common with music is the "patterning of various periodic phenomena in time."[27]

The digital format in particular has provided visual music makers with a distinctive ability to compose with colour tones that could be mapped to a particular frequency. During the period when Whitney was active as a filmmaker this potential had not been fully explored. The colours that he used in *Arabesque*, for example, are arbitrary, in contrast to the exacting nature of the geometric patterns. Whitney achieved the colour transitions by spinning a colour wheel, introducing the element of chance into his filmic composition, in much the same way that Xenakis introduced indeterminacy into his otherwise controlled musical works. Whitney acknowledged that the transient characteristic of colour was, at the time of writing, underexplored, writing that the art of video colour phosphors had yet to begin.[28] He predicted that video would one day allow for "an intimate one-to-one control of colour change" allowing colour to become more of a "force of dynamic expressive power" and "less a subject of static contemplation as in

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[23] John Whitney and James Whitney, "Audio-Visual Music: Colour Music – Abstract Film 1944," *Digital Harmony: On the Complementarity of Music and Visual Art*, John Whitney, 1980, Peterborough, New Hampshire: Byte Books/A McGraw Publication. p. 142.

[24] *ibid.*

[25] *ibid.*

[26] John Whitney, "A Computer Art for the Video Picture Wall," *op. cit.*, p. 188.

[27] *ibid.*

[28] John Whitney, *op. cit.*, p. 86.

painting toda*y,"*[29] eventually becoming the equivalent of a musical instrument in an orchestration that could be called on a composer for a particular timbre or dynamic. The neon phosphorescent colours of *Arabesque* are certainly the least striking aspect of the film, yet they do serve to introduce some interest into proceedings, helping to demarcate the separate polyphonic patterned layers of curves and arabesques that make the visual melody of the film.

THE USE OF MUSIC IN WHITNEY'S DIGITAL FILMS

Another aspect of Whitney's digital films that I must also draw attention to, particularly in regard to *Arabesque*, is the fact that Whitney did not compose the music for the films. Whitney has stated that the images for his digital films always came first.[30] In *Permutations*, for example, the sequences and colours were all completed before Whitney selected the music. Yet Whitney found astonishing relations between his images and the music when they were married.

The music for *Arabesque* was also composed on completion of the film. As a trained composer and musician, who had formerly composed the soundtracks of his own films, in addition to having been particularly critical of earlier visual music filmmakers such as Oskar Fischinger who had orchestrated their images to previously composed tracks, one would have expected Whitney to have written the music for *Arabesque* himself. However, after searching for music to fit the idiosyncratic rhythmic structure of the film Whitney commissioned Manoocheher Sadeghi, an academic from UCLA to improve a soundtrack based on classical Iranian Santour Music. By turning to this specific genre of music Whitney is making a connection not only with the title of the film but also with Islamic ideas of the cosmos, music, geometry, the figure of the arabesque and architecture, all of which were derived from the influence of Pythagoreanism on Islamic culture. Although this was a thoughtful musical compromise it is still a profound compromise to Whitney's ideas of mathematical harmony. Were Whitney to fully and rigorously execute these ideas it would require a direct translation of the digitally generated images into digital sound. One can speculate that the processing capabilities required for this symbiotic generation of both images and music from an identical mathematical code simply did not exist during Whitney's period of working. As evidenced earlier in this chapter there was still a certain amount of analogue and personal participation involved in

[29] *ibid.*, p. 91.
[30] John Whitney, Interview, Youngblood, *op. cit.*, p. 221.

the digital process so this could have further hampered an exact translation between sensory realms. Of course, Whitney's own technical limitations may also have led him to seek an alternative musical solution but it seems more likely that he wished to focus primarily on the task of orchestrating the visual images in this fledgling art form.

THE DIGITAL DATABASE

Whitney himself considered *Arabesque*, the film that was to be the apogee of his research, to be a compromise as, in his opinion, his digitally composed image does not match with its composed music. He writes that it is as "severe a compromise as any others I accepted reluctantly upon this long road toward the goal of free composition with instrumentation allowing perfected digital access to image and sound through digital harmony."[31] This is something that Malcolm LeGrice concurs with. According to LeGrice, none of his computer films have fully developed the idea of programmed permutations as he mostly uses the computers to "produce isolated sequences of abstract imagery, which are then later combined and transformed according to aesthetic principles at variance with the intrinsic capabilities of the computer."[32] Yet, it is this very ability to produce and combine isolated sequences that are part of the unique appeal of Whitney's visual music films. Whitney creates what theorists of new media such as Lev Manovich refer to as a "database"[33] of image sequences such as that employed in computer science, which he draws on to create his audiovisual compositions in much the same fashion as an electronic musician or composer of musique concrete might draw on a database of samples to formulate their musical compositions.

This use of a *database* of images is not unique to Whitney. In *The Language of New Media* Manovich writes of a "database cinema" typified by filmmakers Peter Greenaway and Dziga Vertov but Whitney's use of the database differs from both of these filmmakers due to the formal structure of his audiovisual texts. Whitney is consciously referencing music and musical form throughout his films and using it to give a logical structure to his sequences of images. Both Richter and Eggeling relied on banks of image sequences that were assembled to create their seminal visual music texts. These image sequences functioned like motifs in music that were combined and reused just as musical

[31] John Whitney, *op. cit.*, p. 75.
[32] LeGrice, *op. cit.*, p. 78.
[33] Manovich describes the word database in computer science as referring to a "structured collection of data" that can be organised and searched. Lev Manovich, "Database as a Symbolic Form 1998," www.manovich.net/DOCS/DATABASE.RTF, [Accessed: January 23rd 2011].

figures or motifs are reused within a musical composition. This is also in evidence in other films that have been analysed in the course of this thesis such as *Kreise* by Oskar Fischinger, who reuses particular image sequences that correspond to melodic figures in the musical soundtrack. In fact, almost any of the films included for analysis in this thesis can serve as examples of database cinema due to their abstract non-narrative nature and bank of image sequences that can be drawn on when required. Even the freeform hand painted animation *Begone Dull Care* by McLaren and *A Colour Box* by Lye, which required drawing in relation to the musical improvisations of the soundtrack have, to a certain degree, recourse to a database of reusable images that correspond pseudosynaesthetically or rhythmically to particular riffs or instruments. The same can be said for the *cosmic* visual music films of James Whitney and Jordan Belson which draw on sequences of images that could conceivably be moved around at will.

This idea of a database of content that can be searched and organised is a reflection of changing thought processes. Whitney has stated that he thought of his work as the development of a new communicative mode.[34] However, even if most abstract visual music films can theoretically be thought of in terms of *database cinema*, Whitney's computer generated visual music films, with their basis in mathematics, are a distinctly different beast. For one thing Whitney was literally working from a computer database of images that he could combine in whatever permutations he wished. Manovich posits that in Whitney's computer films "the effects are just effects" whereas in Russian director Dziga Vertov's *Man with a Movie Camera* (1929) they acquire meaning because Vertov's film is motivated by an argument.[35] However, this is missing the point. Arguments exist in Whitney's film, perhaps not at an ideological level as they do in *Man with a Movie Camera* but they do occur at a mathematical level. Whitney poses a mathematical question which is then resolved by Citron's computer program.

In an acknowledgement of these changing thought processes in the computer age; Youngblood compares the way that computers process data to the manner in which neural networks operate in the human brain in *Expanded Cinema*.[36] Whitney's computer films are an early foray into this. Computer animators such as Stan Van Der Beek would also ruminate on this link between thought processes and mathematically based computer processes in the computer films that he produced in collaboration with engineer Ken

[34] John Whitney, Interview, Youngblood, *op. cit*., p. 215.

[35] Len Manovich, "Database as a Symbolic Form," http://www.acsu.buffalo.edu/~erikconr/courses/DMS_259/readings/12_manovich-_ev_rev2.pdf, p. 27, [Accessed: 23rd January 2011].

[36] Youngblood, *op. cit*., p. 185 – 188.

Knowlton at Bell Telephone Laboratories during his residency there. William Moritz posits that these efforts, although primitive, were approaching the workings of the human nervous system.[37]

In his visual music films Whitney is attempting to develop a graphic visual form that operates in parallel to music and not to provide a definitive approach to audiovisual correspondence. Whitney's film work using burgeoning digital technology and supporting written research has pointed the direction forward for successive generations of music practitioners. His importance as a visual music filmmaker should be understood in his position as a transitional figure providing a bridge between analogue or hand-crafted visual music and visual music generated digitally. Animators such as Larry Cuba, Stan Vanderbeek and Whitney's own sons, John Jr. and Michael, the so called *second generation* of computer animators would build on his approach in subsequent decades.

Whitney's digitally composed visual music films changed the way in which the visual music film was composed. His computer film had a colossal impact not only on the aesthetics and form of the visual music film but also abstract cinema at large. I propose that they were just as relevant and groundbreaking at their time of production as Richter and Eggeling's early modernist masterpieces were during the 1920s. Through his use of mathematical harmony as the foundation of his work, Whitney creates a connection between number, the cosmos, music *and* image, thus extending ideas of universal harmony far beyond what even the Pythagoreans had envisaged so many centuries ago. In addition, although he never quite achieved the exact correspondence between music and image that he intended, he still pointed the way forward for others such as Larry Cuba and his son John Whitney Jr., with collaborator Gary Demos went on to win an Academy Award for his contribution to the technical development of computer animation. Serving as a transitional figure between the fine art practitioners who worked with film, he created an entire new language for audiovisual composition that has been picked up and built on by successive generations of animators, motion graphic artists, composers, V.J.s and artists, most of whom are unaware of the origins of his legacy.

In a letter responding to an article by filmmaker Tom DeWitt in the *Leonardo* journal, Whitney states that the purpose of his book was to "define, as I understood them, some principles of harmony as they applied to graphic manipulations of dynamic,

[37] William Moritz, "Stan Vanderbeek," *L'art du Mouvement 1919-199*, Jean-Michel Bouhours (Ed.), 1996, Paris, Cinéma du Musée National d'Art Moderne, Centre Pompidou.

differential motion-pattern by computer."[38] He writes that whether or not his efforts constituted a final valid grammar for visual music seemed irrelevant. He meant to document his own approach to the creation of visual music and to propose "the seminal idea of making an approach to establish this lively new visual art."[39] In fact, in *Digital Harmony*, one can see that he concedes that there are problems when attempting to create a new grammar, as our basic assumptions need to be revised and although Whitney was not entirely successful in his attempts at composing visual music using the digital form and did not achieve the level of *audiovisual harmony* that he laid out in his written work he pointed a way forward for a computer generated visual music.

[38] John Whitney, *op. cit*., p. 205.
[39] *ibid.*

CONCLUSION

At the outset of this thesis I asserted the need for an assessment of the visual music film that takes into account its expressly musical qualities. These qualities of the visual music film have frequently been overlooked or, if alluded to, not critically engaged with as fully as they might have been. This is not to say that writers and critics have not been aware of these musical properties. The very term *visual music* asserts that the opposite is, in fact, true. There is an explicit recognition that music is fundamental to this body of work, which makes it all the more unusual that it is the visual aspect of it that has been foregrounded in critical appraisals. This inquiry is, of course, not the only approach and I do not wish to detract from studies that have taken visual or art-historical approaches. They have served an invaluable purpose; providing a foundation for further study and providing a historical context for this lively art form. Yet I still hope that this thesis has gone some way to remedy what I have seen as the visual and art-historical bias in the field of visual music research.

In this concluding chapter I discuss what the thesis has achieved in terms of its unique contribution to the scholarship of the visual music film. I also consider the implications of my findings and consider how they relate to existing research in the area of visual music. Further to this I reconsider the scope of my study, especially in relation to the methodologies employed. Finally I conclude by addressing other potential areas for research that can build on the research that I have undertaken in the course of this thesis.

FINDINGS, CONTRIBUTION AND SCOPE OF THIS STUDY

As I stated in the introduction, I set out to reassess the predominantly traditional canon of visual music films from a musical perspective, formally, structurally and philosophically and to this end this thesis has enjoyed a modicum of success. In addition to providing this musical reading of the visual music film, this thesis has also conducted a historical survey by means of the overarching chronological structure of this thesis that functions as an alternative to the way in which the visual music film has been historically read. This survey, in addition to considering the visual music film as a discrete entity with a distinctive history, has also explored interdisciplinary debates in music, art and film and has demonstrated the changing aesthetics and philosophies in music and art that are manifested in the visual music film. For example, it has provided a reading of Norman McLaren's trilogy of *Line* films, *Lines Vertical*, *Lines Horizontal* and *Mosaic*, that takes

into account the influence of the drive towards minimalism and its associated philosophy in the arts and music from the late 1950s and 60s.

Further to this, this thesis has examined the existing literature surrounding the visual music film and identified a need for a reassessment of the visual music film from an expressly musical perspective, setting out the extant debates that surround the visual music film, such as its position as an extension of fine art practice and identifying a methodology that could potentially be used to structure a musical reading of the visual music text. This was illustrated by an analysis of *Symphonie Diagonale* by Viking Eggeling and the musical characteristics that it embodies.

In addition to this, it has used the analogy of the *absolute* in music to demonstrate how musical concepts can function across the disciplinary boundaries of music and film. It has stripped down the idea of the absolute into two basic categories; the *formal absolute* and the *spiritual absolute* and applied these musical ideas to the visual music films of Viking Eggeling, Hans Richter, Norman McLaren, Jordan Belson and James Whitney, in the process illustrating how musical ideas can be applied both formally and conceptually to the moving image in order to elucidate the musical characteristics of the text.

By using the concept of the formal absolute and the spiritual absolute as the framework for chapters two and three it has allowed for a thorough overview of changing trends and aesthetics in music, film and art. There is a substantial transformation in aesthetic from the hard-lined minimalist expression of the formal absolute in the films of the modernist visual music filmmakers Eggeling, Ruttmann and Richter and latterly McLaren, who was labouring under a similar philosophic construction and visual aesthetic, and the gaseous, amorphous spiritually informed visual music practice of the American West Coast filmmakers Belson and Whitney in line with changing trends in music, art and film.

The second part of this thesis concentrated less on the philosophical vestiges carried over from musical thought to the visual music film. The focus fell instead on the variety of techniques and technological developments that evolved in tandem with the visual music film, both simultaneously exerting an influence on each other. It explored the effect that colour processing had on not only the visual but the overall audiovisual structure of the visual music film as illustrated by a textual analysis of Oskar Fischinger's circular masterpiece in Gasparcolor, *Kreise*. It also investigated how particular styles of musical composition dictated the development of specific styles such as painting directly onto the celluloid strip in order to capture the syncopated musicality and frenetic

musicality of jazz music. This was illustrated through the examples of *Begone Dull Care* by McLaren and *A Colour Box* by Len Lye. Finally it looked at how the technical processes of animated sound emerged in the search for a greater correlation between the visual and sound tracks of the visual music film. This attempt to extract the musicality of the imagery of the visual music film took two forms. The first involved creating a new visual language based on sound waveforms that allowed visual music filmmakers such as McLaren to visually draw and /or photograph their soundtracks onto both the image and soundtrack so that the audience is seeing the soundtrack. McLaren's *Synchromy* was offered as the prime exemplar of this sound animation. The second approach involved investigating what sounds were produced by images photographed or imprinted onto the soundtrack. This approach was explored by looking at the optical sound films of Guy Sherwin.

Chapter Five married the inquiry into technological innovation of the second part of chapter four with the historical, aesthetic and philosophical concerns of earlier chapters. This was achieved by an investigation into visual music pioneer and father of motion graphics John Whitney's enduring concerns with the unification of sound and image through the shared foundation of mathematical harmony. It consolidated Whitney's position as the transitional figure that marked the move from artisanal methods of composing visual music films to computer based modes of production.

On reaching the end of this thesis I must ask myself, has it achieved what it set out to achieve? I have addressed the issues of the underrepresentation of the musical characteristics of the visual music film through a combination of close textual analysis and an exploration of the historical and philosophical debates surrounding the visual music films at various points throughout its relatively short existence. In addition to providing a re-examination of the visual music film that both complements and broadens existing research on the subject, this thesis has also established it as a distinct and autonomous entity with a specific set of interdisciplinary characteristics drawn from music, film, art, philosophy and mathematics. It has, in addition, evaluated the visual music film musically in as far as this is possible.

Arguably, I have not established a *standardised* methodology for assessing the musicality of the visual music film as a body of work in the same way that a form of breakdown such as Schenkerian analysis can *largely* offer for musical texts.[1] Due to the

[1] The Schenkerian form of musical analysis was formulated by Heinrich Schenker in the nineteenth century that posited that all major musical masterpieces were derived from one type of musical structure.

sheer diversity of aesthetics and techniques, combined with the idiosyncratic nuances of individual films, they do not conform to a *one size fits all* approach to analysis and need to be assessed on their own terms. As Nicholas Cook points out, there is no true universal method for musical analysis so why should there be one for the visual music film, an art form that is at least fifty percent derived from music? This thesis has continuously iterated the need for a combination of analytical approaches when trying to find an appropriate methodology to cope with the hybrid nature of the visual music film that affords music equal status with the visual and has identified an interdisciplinary methodology drawing on textual analysis from film study, musicology, culture and philosophy that at the very least offers a jumping off point for further study.

POTENTIAL FOR FURTHER RESEARCH

Although the idea of visual music has endured, there has been a marked resurgence of interest in the visual music in every sense of the genre with a range of exhibitions, screenings and festivals organised in recent years such as the art exhibition *Eye-Music: Kandinsky, Klee and All That Jazz* is at Pallant House Gallery, Chichester in 2005 and the *Visual Music* Exhibition at the Hirshhorn Museum and Sculpture Garden, Washington D.C. in 2005. The wealth of material available is far greater than when I first began researching this thesis. DVD collections of the work of visual music filmmakers in this study have steadily become available. There has also been a discernible increase in the volume of films available on internet sites such as *YouTube*, in addition to articles appearing on blogs. This explosion in available material and resurgence of interest makes obvious the growing interest in the subject of visual music and most importantly the timely need for this study.

However, as I stated in the introduction, there are some notable omissions from this study. I have not included non-temporal renderings of music or live multimedia events, light shows, or concert and nightclub visuals unless they have proved directly pertinent to the line of argument such as Jordan Belson's involvement with the Vortex concerts in San Francisco in the late 1950s. These were included as they were a vital impetus for his visual music films. I have also excluded more recent incarnations of the visual music film such as music visualisation systems or audiovisual installations as I chose to end this study

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Robert Snarrenberg, "Schenker, Heinrich," *Grove Music Online*, Oxford Music Online, http://www.oxfordmusiconline.com/subscriber/article/grove/music/24804, [Accessed: June 10th 2011].

with John Whitney's tentative forays into a generation of visual music using digital computer systems. Ultimately, this thesis serves as a jumping off point for further research in several areas. It might stimulate a reassessment of the filmmakers and films that I was forced to omit from this study for reasons of space such as those by Stan Brakhage, Dwinell Grant and Mary Ellen Bute. It might also prompt a more thorough re-evaluation of forms of visual music other than the kind of visual music film that I have chosen to research. For instance, although authors such as Kulezic-Wilson and Bordwell have engaged with the musicality of narrative feature films there is probably more scope for exploration in this area, especially if one is to consider this type of film as an example of *Wagnerian* Gesamtkunstwerk.

Moreover, even though I have discovered a current resurgent interest in direct film processes of composing visual music, which is interesting in and of itself, the area of visual music that I would consider to be most ripe for further study is new computer generated visual music. This study, as I have mentioned, has taken the transition from analogue to digital processes as the terminal point of focus but there has been an explosion of visual music using computer processes. One of the most striking forms of visual music is music visualisers such as Apple's I-Tunes, Window's Media Player, WinAmp and G-Force by Soundspectrum. Music visualisers are continuously evolving and transforming at an alarming rate as technology advances and this is the area with the greatest scope for scholarly activity as there currently seems to be a dearth of writing on it.

Now that the terminal point of this thesis has arrived I am hopeful that it has raised questions regarding the manner that the visual music film has thus far been examined. My greatest wish is that I have provided a reading of the visual music film that, in addition to fully acknowledging its musical qualities, has provided a way of reading it musically. I also hope that this has demonstrated that the visual music film and visual music in general is worthy not only of this examination but also of further scholarship that takes into account the musical qualities of this body of works and helps to build on the interdisciplinary analytic framework that I have established in this thesis. Ultimately it is my hope that this research can be taken up and developed in other areas of visual music.

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