THE UNIVERSITY OF
SYDNEY

# A Study on the Use of Vocal Samples
# and Vocal Transformation Techniques
# in the Music of Paul Lansky and Trevor Wishart

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A thesis submitted in partial fulfilment of the
requirements for the degree of
Master of Music (Composition)

Sydney Conservatorium of Music
University of Sydney
2005

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# Abstract

For most, the spoken word holds no more, and no less, an interest other than the implied meaning of the word, while for others, the interest lies in the inherent wealth of sonic substance in that sound. This study is focused on the composers Paul Lansky and Trevor Wishart, their compositions and the compositional processes whereby which they utilise the wealth of sonic possibilities inherent in the human voice in general and in particular the sound of the spoken word in everyday speech and conversations. Focusing in particular on Lansky's *Smalltalk* (1988) and Wishart's *Vox 5* (1986), the majority of the content is concentrated on exploring issues of inspiration and origin, contexts of use and compositional aims, and the technology, procedures and techniques related to the electroacoustic compositions of Lansky and Wishart, as well as on the technological developments directly and indirectly brought about by both composers in their efforts to achieve the results that they desired.

# Chapter 1   Introduction

## 1.1.    Scope and Objective

The aim of this study is to focus on a trait shared by the composers Paul Lansky and Trevor Wishart, namely their skill in perceiving and bringing to the fore, thus giving prominence to the wealth of sonic possibilities inherent in the human voice in general, and in particular the spoken word in everyday speech and conversations, which most people are predisposed to casually dismiss as being mere commonplace occurrences whose merits rest solely on the meanings or implications of the words.

In the interests of making this study as comprehensive as possible, the efforts of other composers in this area have been taken into account, within the limitations of the scope of a discourse of this nature and the time-frame involved, and largely as background material during the preliminary phase, and as a basis from whence to venture forth to accomplish the stated aim. Thus the majority of the content is concentrated on exploring issues of inspiration and origin, contexts of use and compositional aims, and the technology, procedures and techniques related to electroacoustic compositions of Lansky and Wishart that use sampled vocal material, focusing in particular on works like Lansky's *Smalltalk* (1988) and Wishart's *Vox 5* (1986).

It is anticipated that this study will yield useful and comprehensive insights into the compositional processes of the two composers. Further, it is hoped that the endeavour to address issues such as compositional choices made by the composers,

technological limitations and subsequent innovations, and technological developments directly and indirectly brought about by the composers in their efforts to achieve their desired results, while broadening one's own perceptions of compositional technique by providing added stimulation and impetus to one's own aspirations in the field of electroacoustic composition, will also help to pave the way for further research in related areas of composition.

## 1.2.    Methodology

The procedure by which this study was brought to fruition consisted of six major phases, of which Phase One was the preparatory phase, involving the preliminary acquisition of basic recorded material, the tracking down and accumulation of research material from texts and online sources generally relevant to the study.

Phase Two consisted of an aural component and a research component, where the aural component involved listening to selected pieces. Carried out more or less in tandem with the aural component, the research component consisted of researching the accumulated literature on the pieces, as well as consolidated review of the material gathered thus far.

Phase Three was a movement outward, and extending backwards from the point of origin, *i.e.* selected pieces of both composers, consisting of an aural component, a research component, and an evaluative component. The aural component involved listening to early works of both composers, with particular attention to compositions that included vocal material of some sort. The research component

involved the studying of a range of relevant literature while the evaluative component consisted of a brief assessment of the compositional processes and techniques used to realise these works. Furthermore, the setting out of ideas and conclusions gleaned thus far was initiated during this phase.

Phase Four was a movement outward, and extending forwards from the point of origin, *i.e.* selected pieces of both composers, consisting of an aural component, a research component, and an evaluative component. The aural component involved listening to later works of both composers, while the research component involved the studying of a range of relevant literature, and the evaluative component consisted of an assessment of the compositional processes and techniques used to realise these works, as well as a comparison between the compositional processes and techniques employed in the early works.

The fifth phase was essentially a review of the preceding phases, involving cross-referencing and backtracking, in order to ensure that any conclusions drawn from earlier findings were still valid, and to assess and re-evaluate those discrepancies, in the light of new factors that had arisen by the end of Phase Four. This logically took care of the preliminary stages of the final phase, which set out the outcomes of the project, based on the findings of the preceding phases, followed up by concluding views and arguments.

It was anticipated that during the research and evaluative stages of Phase Three and Four, the need might arise to extend the boundary of works investigated to include

works of composers other than Lansky and Wishart. These forays into the domains of other composers were kept to a minimum, partly due to the fact that the scope of this study would not allow for such wide and varied digression, and by dint of the fact that both Lansky's and Wishart's inspirations and influences, techniques and processes, and aspirations and realisations have been extensively documented by themselves and by others, which is not to say that reasonable attempts have not been made to follow up on pertinent leads and avenues that were deemed likely to have had a bearing upon, or influenced by the composers in question.

## 1.3. Literature

The literature surveyed and utilised in the course of this study can be classified into a number of broad categories, and further divided within those categories into a system of smaller, clearly defined subdivisions. Categorisations were based on the methodology undertaken for the study, with the material pertaining to each phase of the research methodology being grouped accordingly.

The first category consists of literature that does not have a direct bearing on the composers on whom this study is based, but serves to provide the basic understanding of the area, thus formulating the background to the topic, as for example, texts dealing with the early stages of electro-acoustic music and computer assisted music composition. *Computer Music: Synthesis, Composition and Performance* (Dodge and Jerse, 1985), provides in-depth information in this regard, and also gives detailed information on electronic techniques used in music

composition, while *The Computer Music Tutorial* (Roads, 1995) was another invaluable source of reference that contributed to this category.

The next category consisted of literature which have a direct bearing on Lansky's *Smalltalk* (1988), and Wishart's *Vox 5* (1986). Core texts for this category included *An Interview with Paul Lansky* (Roads, 1983), *New Voices* (Wishart, n.d.d), which deals with the composer's approach to his works involving voice, including *Vox 5, Computer Sound Transformation: A personal perspective from the U.K.* (Wishart, 2000b), in which the composer goes into great detail about the software that he developed for his compositions, in particular those that he developed for *Vox 5, The Composition of Vox 5* (Wishart, 1988), *A Tuner of His World: An Interview with Paul Lansky* (Riddell, 1998), in which Lansky talks at length about his compositional techniques, *Paul Lansky's Famous Works with Speech* (McCarthy, n.d.), which provided some very significant information and also provided useful links to sound file examples of Lansky's use of voice, and also by the same author (n.d.), *Biography*.

The third category consisted mainly of material relevant to Phases Three and Four of the study. The core texts for this category included *Audible Design* (Wishart, 1994a), which describes approaches to sound composition, *On Sonic Art* (Wishart, 1985), *Trevor Wishart: The Vox Cycle* (Wishart, n.d.) [available online], *Sonic Composition in Tongues of Fire* (Wishart, 2000a), and *Letting the Ordinary Shine Through: British Acousmatic Music* (Young, 2000), which highlights the electroacoustic music trends in the United Kingdom, with specific examples of

works by British composers, and also along similar lines, *Performance Practice in the Presentation of Electroacoustic Music* (MacDonald, 1998).

Also included in this category were *Happily Listening* (Lansky, 2001), which provided insights into the composer's personality and thought processes as pertaining to his approach to the composition of music, and *Some Thoughts on a Song or Two* (Lansky, n.d.) [available online], which is focused on the composer's observations on words and poetry, with information about the use of vocal material and texts in his compositions.

Journals of music, in particular the *Computer Music Journal* published by the Massachusetts Institute of Technology proved to be a most valuable source of information. Specifically related material such as interviews with the composers, reviews of their work, and articles reflecting on the composers' work and techniques, all of which were undertaken by eminent professionals in the musical arena, and analyses and commentaries by the composers themselves on their work, as well as material of no direct bearing on the composers, but that which provided useful and reliable information about contemporaries of the composers, and articles about the general background of electroacoustic music were found to be of the utmost interest and significance to the study.

In addition to the sources mentioned above, information from CD liner notes was used to supplement the data gained from the core texts. It must be here mentioned that while they provide an overview of the contents of that record, including

specific techniques used in the production of a particular piece of music, only rarely do they go into any great detail, for obvious reasons of space restrictions. However, general though the information usually may be, these liner notes have been found to be more up-to-date in their content, in terms of recent technologies and processes, in all probability because it is comparatively easier to provide up-to-date information in liner notes than in books, which invariably take much more effort and time to compile and publish.

Some of the more informative liner notes that accompanied released albums include Wishart's *Red Bird: A Political Prisoner's Dream / Anticredos* (re-issued on CD by October Music, 1992), *Beach Singularity / Menagerie Vocalise* (re-issued on CD, Paradigm, 1998), *Journey into Space* (re-issued on CD by Paradigm, 2002), *Tongues of Fire* (Orpheus the Pantomime, 2002), and *Voiceprints* (EMF, 2000). Similarly, the liner notes of Lansky's *Homebrew* (Bridge Records, 1992), *Smalltalk* (New Albion Records, 1994), *More Than Idle Chatter* (Bridge Records, 1994), *Things She Carried* (Bridge Records, 1997), *Conversation Pieces* (Bridge Records, 1998), and *Ride* (Bridge Records, 2000) provide some useful insights about the compositions.

Furthermore, reviews of recordings of the composers' works were found to be very helpful, and the most useful of these include reviews of Wishart's albums *Tongues of Fire* (Cummings, 1997), *Red Bird / Anticredos* (Couture, n.d.b), *Voiceprints* (Couture, n.d.d), *Journey into Space* (Couture, n.d.a), and the reviews of Wishart's book *Audible Design*, reviewed by Monda (1996), and by Puckette (1996). In

addition to these, reviews of Lansky's albums *Smalltalk* reviewed by Garton (1991), and by Rothstein (1991), *More Than Idle Chatter* (Rothstein, 1995), *Things She Carried* (Appleton, 2001), *Ride* (Appleton, 2002), and *Conversation Pieces* (Lillios, 2003) were also among those that were found to be of relevance to the study.

Internet websites provided a wealth of information, and some of the sites have been mentioned above. However, a large percentage of the websites were either not updated regularly, or not authenticated satisfactorily. This presented a major problem, in view of the fact that there was a lot of detail in these websites, and as much as one wishes to avail oneself of those, it was deemed highly risky, without proper means of verifying the information. On the other hand, through regular visits, and through verifiable links to and from other, established websites, a substantial number of websites were identified as being suitably reliable for the purposes of this study, and these were used to supplement the information gathered from other sources.

# Chapter 2   Paul Lansky

Paul Lansky is regarded as one of the most prominent of modern American composers using computers as compositional tools. He was born on 18th June 1944, in New York, USA, and studied first at Queen's College, with teachers such as George Perle and Hugo Weisgall, and graduated with a Bachelor of Arts degree in 1966. Following that, Lansky went to Princeton University, where he studied under many different teachers, including Milton Babbit, Earl Kim, and Edward Cone, and obtained a postgraduate degree in 1969, and a PhD in 1973. From 1963 onwards, Lansky has taught at the Mannes School of Music, Swarthmore College, and from 1969, he has been teaching at Princeton University.

In addition to his active teaching responsibilities, Lansky has been a visiting professor for several other institutions, as well as being the recipient of many awards such as the Columbia-Princeton Electronic Music Center commission, the National Endowment for the Arts Fellowship, and the American Society of Composers, Authors, and Publishers award (Blostein, n.d.; McCarthy, n.d.; Roads, 1983; Cody, 1996).

Lansky has developed programs such as the programs for *Linear Predictive Coding*, which he uses in his treatment of the spoken word. One of his most notable works, *Smalltalk* (1988), composed from a conversation between him and his wife, uses the words to activate certain pitches, upon which further

transformations are applied so that while the contours and rhythms are retained, the words themselves are not discernible (McCarthy, n.d.).

## 2.1.  Early Directions

Lansky's first compositions, after graduating from Queen's College in 1965, were entirely acoustic, all for chamber ensembles, none composed for voice. During this period, Lansky mostly worked on developing the ideas of twelve-tone tonality as expounded by Lansky's former teacher, George Perle (McCarthy, n.d.). While he was at Princeton, Lansky, having decided to have a closer look at Perle's "12-tone modal system", experimented with the system, and ended up doing things with it that had not been attempted before (Cody, 1996: 19-20). Using Perle's system, and adding a few variations to it, Lansky wrote a piece, and was not quite expecting the enthusiastic response that he got from Perle, when he conveyed to the latter the results that he had come up with (Perry, 1995).

As a direct consequence of Lansky's explorations with the "12-tone modal system", he and Perle embarked upon numerous discussions, followed by an intense period of collaboration, working very closely for about three years, during which they worked constantly on ways to expand the system. In addition to that, Lansky, using linear algebra, developed a mathematical model of multidimensional cyclic arrays derived from the system, and even based his doctoral dissertation, *Affine Music* (1973), on it. Following that, however, while Perle continued working on the system, Lansky soon lost interest, and moved on (Perry, 1995; Riddell, 1998).

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In the early 1970s, Lansky became interested in computers, primarily as a means by which he might explore the properties of the twelve-tone system, the notion being that with the help of computers, one may delve deeper into the complicated structural manipulations associated with the twelve-tone system; manipulations not possible using conventional instruments and performers. Ironically enough, this venture into the realm of computers to facilitate his explorations of serialism led Lansky away from the permutations of the complex pitch relations of twelve-tone music, to developing an interest in using the computer as a "lens on the sounds of the world." (Cody, 1996: 19). He developed an interest in what he perceived to be a dissimilarity in the way that pitch meant one thing in instrumental music, and quite another in computer music (Perry, 1995).

While he felt that in instrumental pieces pitch played an intrinsic and, for the most part, well-defined role, it was not quite the same in computer music. In his computer music, Lansky uses pitch in a way that it, while still functional, does not inhibit other elements from coming into focus. In Lansky's view, music with a pitch-oriented centre of focus were very ably rendered by performers, while the prominent feature of machines were their capability of rendering an entirely different kind of aural landscape (Perry, 1995). Lansky held that ascertaining the role of pitch in a given situation depended mostly on the context in which one is composing. He maintained that in computer music, pitch had the ability to elicit intense reactions by operating in a way that is far removed from the manner in

which it behaves when set against the backdrop of instrumental compositions (Cody, 1996).

### 2.1.1. Music for Tape

While continuing to use Perle's techniques in his instrumental writing, Lansky began to compose music for tape, one of which was *Mild und Leise* (1973) (McCarthy, n.d.). Taking the title of the piece from the opening phrase of the "Liebestod" aria from Wagners' *Tristan und Isolde*, Lansky uses the "Tristan chord", a half-diminished seventh chord, as his starting point. According to Lansky, the score for the movie *Eakins*, by Jim Randall, had the most profound of effects on him. Although the music in question was basically comprised of a lot of sustained, simple tones, Lansky was much impressed with the fact that a machine was capable of being used to render such powerful, yet elegant music, and the experience had a lot of influence on how he approached the composition of *Mild und Leise* (Perry, 1995).

In *Mild und Leise,* while the use of timbre as a structural element, and the use of pre-existing music as a starting point for the composition are features important in Lansky's later development as a composer (McCarthy, n.d.), it is interesting to note that in retrospect, Lansky considers the piece to be unsatisfactory with respect to the way that he had tried to use pitch and timbre. Rather, he is of the opinion that such pitch-class concepts as the 12-tone system did not translate very well into computer music (Cody, 1996).

## 2.2.    New Directions

In Lansky's *Crossworks* (1978), for piano, flute, clarinet, violin and cello, the entire piece is based on the opening chord from Schoenberg's *Fünf Orchesterstücke*, Op. 16. It was at this time that Lansky was starting to move away from the more abstract form of twelve-tone tonality to a form of composition using musical fragments that afforded some degree of familiarity for the listener (McCarthy, n.d.). Becoming progressively less interested in treading the path where one goes from the abstract to the particular, Lansky became increasingly interested in an approach to composition whereby one starts off with something substantial, and takes it apart, using and discarding bits and pieces of the whole, ultimately ending up with something very different to what one started off with, much akin to the way a sculptor works with his material (Cody, 1996).

Indeed, in his own view, Lansky was more of a sculptor than a composer, or more filmmaker than playwright. He elaborates on this stance, during an interview by Joshua Cody in 1993, saying that were one to draw an analogy between a composer and a playwright, one would note that they are both writers, whose writings are subsequently interpreted by other people, that is to say, by the performers. Continuing on this line of thought, were one to consider the task of the filmmaker, the fact that he or she produces the finished product could well lead one to conclude that the filmmaker is really the performer, in a manner of speaking (Cody, 1996).

Having entered into music as a performer, the function of the performer and the excitement associated with performing were factors important in determining Lansky's musical direction. In essence, writing for the computer medium enabled him to play the role of composer and, more importantly, that of the performer as well. According to Lansky, he still writes what he calls "protein-based" pieces for "protein-based" systems, in addition to "silicon-based" pieces (Cody, 1996: 21). Evidence of this can be seen by the interspersion of works involving traditional media within a long stream of electronic works. Examples of these "protein-based" pieces include *Talkshow* (1989), for live vocalists; *3 Campion Choruses* (1992), for voices; *Hop* (1993), for violin and marimba; *Crooked Courante* (1997), for solo guitar; *Semi-Suite* (1998), for guitar; *Odd Moments* (1999), for flute, clarinet, violin, and piano; *Ricercare* (2000), for string quartet; and *Follow Me* (2002), for electric guitar quartet (McCarthy, n.d.; Sadie (Ed), 2001).

Although Lansky professes not to be particularly involved in mixing traditional instruments and computer-generated elements (Cody, 1996), some of his compositions contradict this position. These include *As If* (1981-2), for string trio and computer-synthesized tape; *Values of Time* (1987), for string quartet, wind quartet and tape; *Stroll* (1988), for flute, violoncello, marimba, pianoforte and tape; *Dancetracks for an Improvising Guitarist* (1994), for improvising guitar, electric guitar and tape; *Six Years Ago, Monday* (1996), for marimba, violin and tape; and *Dancetracks: Dark Remix* (1997), for guitar and tape (McCarthy, n.d.; Sadie (Ed), 2001).

## 2.3. Electroacoustic Compositions

In *Artifice (on Ferdinand's reflection)* (1976), based on a line from Shakespeare's *Tempest*, Lansky attempted to build up upon a simple tune, progressively transforming it into a much more complex state (Roads, 1983). Primarily aimed at creating timbral and dramatic effects, the vocal material was manipulated by using the Linear Predictive Coding (LPC) algorithm (Roads, 1983), which was originally developed by Bell Telephone Laboratories as a means of improving the efficiency of speech transmission through the manipulation and compression of the human voice. As such, it was ideally suited for Lansky's compositional needs and it was a technique that he commonly employed from then on (McCarthy, n.d.).

According to Lansky, *Artifice* was "a hesitant attempt to deal with words in music.", and subsequently, in 1979, with a view to using the sound of speech as a musical object, Lansky broke away from his other styles of writing with *Six Fantasies on a Poem by Thomas Campion*, which proved to be a defining moment in his compositional career (Roads, 1983: 18; McCarthy, n.d.). In *Six Fantasies*, several technical and compositional features later to become prominent in his music make their first appearance (McCarthy, n.d.), and since then, much of Lansky's music using pre-recorded sounds involves the manipulation of the human voice (Blostein, n.d.).

Lansky felt passionately about all kinds of music, and that being said, it is to be seen that he was constantly coming up with compositions that had very definite links to specific genres of music, for example, *Guy's Harp* (1984). According to

Lansky, this is a "portrait" of a blues harmonica player and "a kind of documentary.", being based on recordings of improvisations by blues harpist Guy DeRosa (Rothstein, 1991: 118). Lansky uses the computer to extract pitch and amplitude parameters and applies them to digital plucked-string instruments, and uses the resulting sounds, and the original harp sounds in a variety of combinations (Garton, 1991). The piece was a breakthrough for Lansky, in the sense that while he was keenly interested in learning to play the blues harp, this was just one of a million other musical things that he wanted to get involved in, and it just not being realistic to try and do everything, he discovered that it was quite possible for him to pursue these other musical interests in his own way; that is, by using sonic representations of all kinds of music in his computer-assisted compositions (Riddell, 1998).

Some of the other kinds of music that Lansky was fascinated with include rap music, which inspired *Idle Chatter* (1985), *Just More Idle Chatter* (1987) and *Notjustmoreidlechatter* (1988), of which more will be said later in this discourse, and rock music, from which transpired *Not So Heavy Metal* (1989), which, according to Lansky, is akin to *Guy's Harp*, but set in terms of rock (Riddell, 1998). Featuring the talents of Lansky's Princeton colleague, electric guitarist Steve Mackey, *Not So Heavy Metal* is another "portrait" piece, one which depicts the guitarist playing around with licks and riffs, and in general exploring and pursuing the musical potential within both him and his instrument (Garton, 1991: 117).

As asserted by both Garton (1991) and Rothstein (1991), there is a significant and common thread woven into much of Lansky's works, that of the juxtaposition of distinct foreground and background components, usually with the more vibrant and energetic elements of the former being set against the more sustained and languorous texture of the latter, providing the pieces with their characteristic mesmerizing quality.

### 2.3.1. Live Music versus Electronic Music

Lansky has written that electronic music destined to be listened to through playback of the chosen medium, in contrast to music performed live, must not only find ways in which to arouse the interest of the listener in the first instance, but must, with repeated listening, continuously find new ways to keep aroused that interest on the part of the listener. In the case of music being performed live, on the other hand, the entire experience is accompanied by a whole range of preconditioned cognitive skills on the part of the listener, skills such as listening, observing, and passing a judgment of sorts on the competence exhibited by the performer or performers. Thus in this context, there is a tension that is not present when listening to recorded music (Lansky, n.d.). Furthermore, with live music, each performance is distinct, in the sense that the performers differ from performance to performance, and the result is thus not quite the same each time. In composing music for the recorded medium, one has none of the advantages as applied to live performance, and one has to devise other strategies to keep the listener attuned to what is happening in the music at the time (Riddell, 1998).

From the early '80s onwards, Lansky was constantly working on ways to reposition the music "in the ear of the listener, rather than in the hands of the performer." To this end, he created intricate layers of sound in his compositions, just so that one had to make an effort to make sense of, or to get to grips with what one was hearing (Riddell, 1998). To sustain the listener's attention, Lansky uses seemingly random complexities of texture, inter-linked with indications of familiarity, interwoven with, at times, quite simple inflections of pitch and timbre, all of which is intended to captivate the interest of the listener, and to urge them to be inquisitive, to explore. As he writes, in *Some Thoughts on a Song or Two*, "The point of the pieces is not to bewilder, however, but rather to provide an engaging context which is amenable to repeated listenings. The randomness and complexity of the texture creates a listening environment which encourages the ear to wander and be curious." (Lansky, n.d.).

Lansky's computer-based explorations provided him with a fresh outlook on the intricacy and inherent richness of the human voice and the sounds of the real world, and as a direct consequence of this newly rekindled interest, he was wont to pursue these avenues in his subsequent compositions (Roads, 1983). Possibly a factor important in influencing Lansky to use 'real-world' sounds in his compositions was that these sounds were often more profound and diverse in complexity. In addition, they had perceptible connections to experiences in everyday life, and thus he reasoned that listeners were more predisposed to enjoy these, with little or no waning of interest (Riddell, 1998). In this regard, he started

using sounds of speech, which he considers to be the most obvious choice for a sound source (Cody, 1996).

Furthermore, having realized that his perspective on the role of the composer had changed, Lansky took on the view that he was in essence an interpreter of sounds, making decisions as to which sounds to focus on, and from which angle to reveal them from (Roads, 1983). Whereas the *musique concrète* movement dealt with ways in which the sounds of the world were used as a source from which composers could create their own new sounds, Lansky's new compositional stance differed from that in the sense that he was more concerned with the extent to which the computer could be used as an "aural camera" through which the sounds of the world could be viewed in a new way, asserting that it was possible to "make ordinary noise that we take for granted, extraordinary." (Cody, 1996: 21).

Following on from his experiences in composing *Six Fantasies*, Lansky had been attracted to the possibilities of transforming established types of music and musical sound using approaches similar to those that he had used for speech transformation, as a consequence of which he started using linear prediction on folk-like material. While many a composer had dealt with folk songs over the ages, Lansky sought to address the issue on a different plane, an approach more akin to that of *musique concrète* composers. That is to say, his intent was to 'photograph' folksongs as musical objects, a complex feat in light of the fact that these folksongs came fraught with their own musical as well as historical connotations,

and as a result, the experience was, for Lansky, similar to that of setting text (Roads, 1983: 19).


## 2.4.    Use of Vocal Material

Firmly convinced that the human voice, speech and music were inextricably connected to each other, Lansky explored and pursued various avenues by which he might use the voice in musical contexts. Throughout the course of this venture, he formulated views and beliefs based on his experiences, evidence of which are to be seen in his compositions. Lansky has elaborated on these notions in various interviews and articles, stating his beliefs that the use of voice and text within a musical context affords much in the way of attracting and maintaining attention, as well as in encouraging curiosity on the part of the listener. In this regard, of particular note is an article posted on his website, titled *"Some Thoughts on a Song or Two."*


Lansky asserts that present within speech is an abundance of musical material, and that speech and song should be considered as being the extremities at either end of a spectrum in-between which are varying degrees of both. Noting that key aspects of music, such as rhythm, phrasing, timing, form and repetition, are also fundamental elements in poetry, he (n.d.) considers the reading of a text and the performance of a musical score to be very much alike, and uses both as source material for his compositions (McCarthy, n.d.). According to Lansky (n.d.), music is capable of transforming text and poetry, by enhancing the intrinsic qualities beyond the sphere of their original existence, while the presence of a voice changes

the musical context in significant ways, owing to the fact that the voice cannot be regarded merely as just another sound among many other sounds.

### 2.4.1. Text

A set of computer explorations on the sounds of speech and poetry, *Six Fantasies on a Poem of Thomas Campion* was composed during the years 1978 – 1979, and marked a turning point in his compositional career (McCarthy, n.d.). Lansky himself remarks on the decisiveness of the work with respect to his future directions, expressing that not only was this the first computer piece that he was completely satisfied with, but it was also the first piece that he had ever written that he was totally content with, and that this contentedness was one of the factors that influenced him to commit himself to the direction that he took from then on (Riddell, 1998).

Lansky's feat of using a text that has references to music and sounds as a basis on which to compose a piece of music has been likened to how a visual artist might use letters and numbers to create a painting, in which the objects and what they denote are equally significant to the structure and purpose of the artist (Rogers, 1983). Interestingly, Lansky has asserted that he was not particularly good at setting text to music or at writing songs, and that *Six Fantasies* was just his way of writing a song, and also expresses his hopes that speech would sound like a song by the end of the piece (Perry, 1995), and in that, he has been very successful (Rogers, 1983). Moreover, the originality and resourcefulness with which Lansky

uses text in his works has been praised as being ingenious as well as revolutionary (Riddell, 1998).

Having been brought up listening to European opera and vocal music, but not really comprehending the words as such, Lansky's personal view was such that he regarded the setting of a text to music as being a meaningless undertaking. In this vein, he was of the opinion that were he to compose conventionally for the voice, he would in essence be treading old ground, following the paths already taken by many other composers. Therefore, Lansky resolved to use speech as a musical object, and the *Six Fantasies* was the first of his works composed to this end. According to Lansky, his objective of compelling the listener to perceive speech not merely as the sound of someone talking, but rather as musical objects, by isolating the various components such as pitch contour, syllables, plosives, and articulations, has been achieved in this piece (Roads, 1983).

Based on readings from the famous poem "Rose-cheekt Lawra", from Campion's *Observation on the Art of English Poesie* (1602), *Six Fantasies* consists of the movements *her voice, her presence, her reflection, her song, her ritual,* and *her self,* with each movement highlighting specific aspects of the reading. Asserting that the poem itself was the composition, and the reading of that poem was the performance, Lansky wanted to be in a position to have access to, and to manipulate, the 'music' that the poet wished to convey through a reading of his poem (Lansky, n.d.). With the intention to "explicate the implicit music in speech",

Lansky processed the sounds of the readings done by his wife, Hannah, and ended up with a very 'musical' interpretation of the poem (Lansky, n.d.; Cody, 1996: 21).

In the first movement, *her voice*, Lansky effectively compels the listener to detach oneself from the subconscious attempt to assume the reading as speech, by creating a chordal texture with three simultaneously-sounding transpositions, and by accentuating the contours of the reading. The second movement, *her presence*, exaggerates certain phrases and sustains the vowel sounds, while the third movement, *her reflection*, uses comb filters activated by the voice to reflect back upon the reading, emphasising the sound of the reading itself. The fourth movement, *her song*, influenced by jazz vocal techniques, highlights the articulations and the physical effort required to perform those articulations, while the fifth movement, *her ritual*, is focused on bringing to the fore the more noisy aspects of the reading, such as plosives, and leads into the sixth and final movement, *her self*, which features the original reading set against a backdrop of vowel sounds (Lansky, n.d.).

Another of Lansky's endeavours to set other people's poetry to music was *Word Color* (1992), using verse 17 of Walt Whitman's poem *Song of Myself* as the basis. The reading was processed to enhance the melodic and harmonic qualities of the spoken words (Rothstein, 1995), and random words were passed through comb filters set to reverberate at length to create a ringing texture, on top of which is layered the comparatively unchanged reading of the text. To avoid the implication of melodrama, the words themselves trigger the filters and thus the accompaniment

of sonic events, establishing a comprehensible link between the spoken words and the accompaniment (Lansky, n.d.).

Based on his beliefs that poetry is in essence an extremely musical form of speech, and that both speech and song exist as the extreme ends of the same spectrum, and also that the text of a song is inseparable from its musical context, Lansky went on to compose original texts in collaboration with his wife Hannah Mackay, and has used the latter's readings of these texts as source material in his electroacoustic compositions, *Now and Then* (1991), and *Things She Carried* (1997). In *Now and Then*, fragments of text dealing with attributes of time, such as "once upon a time", and "long, long ago" and so on, from children's stories are used as a basis. The fact that the narration is in a female voice, coupled with the fact that in the text, much is implied but never really elaborated upon, encourages one to mentally re-enact the storyline and to make connections with childhood experiences of having a story read to one (Perry, 1995; Lansky, n.d.).

In *Things She Carried,* Lansky paints a portrait of a woman by using fragments of text that reveal different facets of her life, such as her mind and her memory (Clark, 1997; Lansky, n.d.). In a review of the work, Appleton (2001) draws a stylistic parallel between *Things She Carried* and works of other composers such as Laurie Anderson, David Byrne, Charles Dodge, Arvo Part, and Steve Reich. About an hour in duration, the piece is made up of eight movements, incorporating a variety of fascinating musical events achieved by Lansky's compositional choices, and his highly accomplished skill of processing and manipulating the

voice, all combining to achieve an evocative and outstanding piece of electroacoustic music (Appleton, 2001).

In his writings and interviews, Lansky has made references to the compositional decisions and significant features that are common to both *Now and Then* and *Things She Carried*. Of particular note is the use of a female voice as the basic source of vocal material, a decision that Lansky feels is justifiable because of his conviction that a female voice would be more conducive for listeners to make the almost subconscious connections between the text and their own experiences, as was his intent. Moreover, stressing the significance attached to the articulation and the expressive quality of the narrations themselves, which have a direct bearing on many of the compositional processes used, Lansky (n.d.) asserts that were he to have used another person as the reader, the results would have been entirely different.

In both pieces, the narratives consist of disjointed phrases, and there is apparently little or no connection between one statement and the next, nor is there a noticeable continuity or sequential bias outwardly evident in the order in which they are presented. The use of short phrases with the potential to evocate imagery related to what was being heard, and quite possibly to one's own experiences, influence the mind to conjure up appropriate imagery, with brief respites in-between phrases encouraging one's own extension and variation of the illusions thus created. The listeners are inadvertently compelled to draw upon their own experiences in a subconscious attempt to discern underlying connections between statements and to

impose their own logic and judgement onto that sequence of events, and in doing so, perceive the pieces more or less on their own terms (Lansky, n.d.).

Musical sounds triggered by the phrases create a harmonious texture, establishing a suitably relevant context in which the phrases in the foreground provoke their imagery, with the rhythmic pace being influenced by the onset of each phrase and by shifts in the texture caused by corresponding movements in the harmonies. Lansky equates the music to "a thread which weaves in and around time, mediating the flow of the text.", whose primary function is "to create a context which leaves room for the listener to build mental images." (Lansky, n.d.).

### 2.4.2. Speech

*Idle Chatter* (1985), *Just More Idle Chatter* (1987), and *Notjustmoreidlechatter* (1988), are three of Lansky's compositions using incomprehensible speech, and are excellent examples of musical compositions that exist on the recorded medium, yet keep the listener occupied, even with repeated listenings (Rothstein, 1995). *Idle Chatter* is the piece in which Lansky first consciously started to use structurally simple, sustained pitches (or sounds) in the background, on top of which are layered extremely complex and barely intelligible snatches of conversation, phrases and words (Cody, 1996).

Lansky initially started out with quite complicated pitch structures, found the resulting sounds much too demanding acoustically to be gratifying to a listener, and consequently decided to simplify the texture in some ways. A B-flat triad was

inserted into the background, not to assert or imply tonality, but to act as a kind of home-base, from which the listener could venture out and explore the vast complexities of sound that were being proffered. Lansky likens this to a situation in which he invites the listener to a familiar place, and then shows the listener something that he or she is accustomed to, but which is now set in a different context (Cody, 1996).

In all three of the *Idle Chatter* series, Lansky uses a Linear Predictive Coding algorithm, granular synthesis, and extensive mixing techniques, and applies these onto recordings of conversations between people (Perry, 1995; Rothstein, 1995; McCarthy, n.d.). The phrases were cut-up into isolated words, the pitch adjusted, and then transposed; sustained effects were accomplished with granular synthesis techniques, while algorithmic procedures were utilized to treat a large proportion of the work, which, according to Lansky, was an approach that he tended to use a lot of the time (Perry, 1995). There is innate relationship between the three pieces, with an almost ceaseless flow of chattering in the foreground, contrasted against a backdrop of comparatively more restful patterns. The voices come across, at times as seemingly random chatter, while at other times they are more subdued, and all the while they beckon and cajole the listener to try to decipher the utterings, barely intelligible, and yet ostensibly familiar (Rothstein, 1995).

Lansky has written that one of the things that had an influence on his approach to the *Chatter* pieces was his enthrallment with the busy movements of the New Jersey Percussion Quartet in one of their concerts, the constant motion exhibited by

the performers in moving from one instrument to another, and in changing the mallets as required. For Lansky, it was indicative of how a computer might be used to generate varied layers of sounds (Perry, 1995). Another influence, directly related to the composing of *Just More Idle Chatter* (1987), was the role of backup female vocalists in bands (Perry, 1995; Riddell, 1998).

In the *Chatter* pieces, the backgrounds provide a consistent wash of sustained vowel sounds, which help to achieve continuity of texture, as well as offering listeners "a place to rest their weary ears." (Lansky, n.d.). In *Notjustmoreidlechatter* (1988), the contrapuntal character of the series is more pronounced, and there is more interaction between the foreground and the background (Perry, 1995; Rothstein, 1995). Extending along this line of compositional process, in *Idle Chatter Junior* (1999), Lansky uses the voices of men, women and children to achieve his characteristic trademark in this genre, that of a dynamic foreground set against subtle shifts in a languid, harmonic background (Appleton, 2002).

Of the *Chatter* pieces, Lansky asserts that the inherent speech is just an impression, with no intent to mean anything, but rather to create an energetic rhythmic and harmonic texture (Lansky, n.d.). When faced with the complicated babble of voices, listeners are intrigued enough to try to hear the actual verbal content, and while they do not succeed in their quest, they are nevertheless drawn into the music. According to Lansky, the feedback that he had received from some of his listeners has been surprising, in the sense that no one has heard exactly the same

things, that is to say, each one admitted to hearing something entirely different, even listeners of other languages. Evidently, everyone seemed to choose a different thread to follow (Perry, 1995; Lansky, n.d.).

As with the *Chatter* pieces, *Smalltalk* (1988), *Late August* (1989), and *Same Scene, Nine Years Later* (1997), also make use of unintelligible fragments of speech, albeit approached from a different perspective (Lansky, n.d.). Where *Smalltalk* uses a conversation in English between Lansky and his wife, *Late August* (1989) is built on a recording of a conversation in Chinese between two individuals. There are basic similarities that are noticed upon listening to both pieces, such as the rhythmically-active plucked-string sound events superimposed over the slower-paced harmonic background, and the extremely obscured words with the occasional sibilant sounds (Garton, 1991; Lansky, n.d.). As in the *Chatter* pieces and in *Smalltalk*, incorporated into the texture as the 'background' are 'restful' threads of material which one might use as a kind of a reference point while exploring the complexity of the proffered musical ideas. As postulated by Garton (1991), the harmonic framework thus created illuminates the foreground in a subtle and delicate fashion, to bring to the fore the concealed aspects of the conversation (Rothstein, 1991).

Despite superficial similarities, similarity of treatment of the source material, and the structural resemblances between *Smalltalk* and *Late August*, the latter exhibits a characteristic uniqueness, arising from the different melodic and rhythmic contours of the source material. The spoken Chinese of the conversation affects plucked-

string filters in a different way, resulting in an interestingly different vivaciousness on the part of the foreground material. Garton (1991) suggests that an essential point to note here is the expertise with which similar procedures and approaches are used in both pieces to render musically viable works, each unique in significant ways that heighten the key aspects of the source on which the piece is based.

As exemplified by *Word Color*, and *The Lesson* (1989), the degree of complexity in terms of pitch and structure used by Lansky depends largely on the context and make-up of the source sounds (Cody, 1996: 23). Composed for the 60th birthday of J. K. Randall, a colleague of Lansky's, *The Lesson* is based on a conversation between the two, and incorporates a complicated texture of pitches that do not conform to conventional tonal and atonal notions, but rather, function as a form of voice-leading. According to Lansky, the choice to use such complexity was made in order to shape the music to closely reflect the context and gist of Randall's comments, which were about the difference between Beethoven and Mozart (Cody, 1996; Rothstein, 1995).

Lansky maintains that some of his pieces, like *Memory Pages* (1993) in particular, are not really destined for performance in front of large audiences, but more effective when listened to in a more private setting, since they are composed with a more personal and intimate perspective (Perry, 1995). *Memory Pages*, using recordings of fragments of dialogue between Lansky and Hannah as the basic vocal material, vacillates between the clearly comprehensible to the barely intelligible, with words, phrases and snatches of conversation combined with

highly-processed sonic events, mutually reinforcing and emphasizing each other (Rothstein, 1995).

# Chapter 3  Trevor Wishart

Trevor Wishart was born on 11th October 1946, in Leeds. He studied at Oxford University, where he completed his first degree in 1968, went on to finish a Master of Arts degree at the University of Nottingham in 1969, and obtained a doctorate in composition, at the University of York in 1973. Following that, he worked as a freelance composer, whilst giving lectures at institutions in the UK, the USA, Canada, Australia, Sweden and the Netherlands (Sadie (Ed), 2001: 449). Wishart was an active composer of orchestral and electro-acoustic music, before his interests diverged into explorations of the human voice using computers. After his father's death in 1969, he discarded conventional forms of music in favour of more progressive and organic ones, recording sounds of machinery from workshops and the like (Wishart, n.d.g; Couture, n.d.c).

## 3.1.  Directions

Wishart's early works were for the most part based on found objects and improvisation, music installations, and performances, games and workshops with a high degree of audience participation (Sadie (Ed), 2001; Couture, n.d.c). From the 1970s, in addition to his electro-acoustic composition, he was involved with pioneering and producing site-specific events, such as *Landscape* (1970), *Seaside* (1971), *Wicked Wizard of Wentworth* (1972), *Forest Singularity* (1976), *Beach Singularity* (1977), *Vocalise, Automusic,* and *Birthrite – A Fleeting Opera* (2000), with Max Couper (Sadie (Ed), 2001: 449; Wishart, 2000b; Couture, n.d.c; Jansen, n.d.). Wishart has also designed and produced the soundscape for the *Jorvik Viking*

*Centre*, a museum in York which exhibited historically accurate reconstructions coupled with modern multimedia processes (Wishart, n.d.a).

In 1970, Wishart joined *Interplay*, a community-arts organisation based in Leeds, and during the time of his involvement with them he developed musical games of educational value, which are now being utilised in music workshops. Other new workshop techniques have been developed by Wishart, in association with organisations and institutions such as *Contemporary Music for Amateurs* (COMA), the *Firebird Trust*, the *London Sinfonietta*, and the *Sonic Arts Network*. Audience-participatory music events have been organised in the UK, Scandinavia and Japan. Two such participatory multimedia projects are *Spanner* (1977), for a large group of adults and materials, and *White Clouds*, for amateur vocalists and tape (Sadie (Ed), 2001; Wishart, n.d.b; Couture, n.d.c).

Explorations and extensive research into the human voice were undertaken by Wishart early on in his career, and he has developed and honed many such extended vocal techniques to a fine degree. His first experimental vocal work, *Machine 2* (1969) centres around a small chorus that imitates, with varying degrees of modifications, the sounds of machinery played back on tape. Recordings of the improvisations by the chorus, along with the original sounds that prompted these improvisations and current news items were compiled into *Machine – an electronically preserved dream* (1970) (Wishart, 1990; 1992; n.d.d; n.d.g). Another piece, *Anticredos* (1980), written for minimal percussion and six vocalists using amplification and extended vocal techniques to perform and render transformations

on the word "credos", puts into use many of the new techniques that Wishart had diligently amassed, especially the technique of an apparently seamless transition from one sound to another (Wishart, 1990; 1992; n.d.d; Couture, n.d.b).

Wishart's works for music theatre include *Fidelio* (1976), for flute, clarinet or saxophone, mime, six suitcases and six portable tape recorders, *Tuba Mirum* (1978), for tuba, three mimes, props, costume, set and stereo tape, and *Pastorale - Walden 2* (1979), for flute, tuba, props, costumes, set and stereo tape. The latter is depicted in a film called *Pastorale*, by David Hutt, while the site-specific event *Automusic* has been filmed for the BBC's *Sounds Different No. 6 – Music Outside*. As well as these, Wishart has composed instrumental music such as *Kaleidoscope* (1969), for large orchestra, and *Dance Music* (1992), consisting of four polyrhythmic movements synchronised to click-tracks, and *Polysaccarides* (1969), for a small ensemble of eight clarinets (Sadie (Ed), 2001; Wishart, n.d.e).

Wishart's electro-acoustic music includes *Journey into Space* (1972), *Menagerie* (1976), *Fanfare and Contrapunctus* (1976), *Red Bird – A Political Prisoners' Dream* (1977), *Anna's Magic Garden* (1982), *Vox 5* (1986), *Tongues of Fire* (1994), *Blue Tulips* (1994), *Fabulous Paris* (1997), *Two Women* (1998), and *American Triptych* (1999). It was during the composition of *Vox 5* (1986), one of a series of six works collectively titled *The Vox Cycle*, that Wishart developed new computer techniques for sound transformation and morphing (Sadie (Ed), 2001; Wishart, 2000b; n.d.d).

The processes developed by Wishart to manipulate and transform recorded sounds have been extensively documented in his books and publications in music journals. Of particular note are his books on sound manipulation and transformation. These books, *On Sonic Art* (1985), and *Audible Design – A plain and easy introduction to practical sound composition* (1994), have had a significant impact on defining the domain and technique of the relatively new area of sound composition (Sadie (Ed), 2001; Wishart, n.d.e; Couture, n.d.c).

Other publications by Wishart include *Red Bird – a document*, in which he reveals and expounds upon the structural and compositional aspects and techniques that he used in composing the tape piece *Red Bird*, two educational musical games, *Sounds Fun*, and *Sounds Fun 2*, both of which have been translated and published in Japanese, *Whose Music – A Sociology of Musical Languages* (1977), co-authored with Shepherd, Virden, and Vulliamy, and *Book of Lost Voices* (1979). In addition to these, he has documented the projects that he undertook during the early 1970s, in *Sun, Creativity and Environment – Education, community and environmental projects* (1974), and *Sun, A Creative Philosophy* (1975), which deals with his projects from the late 1970s (Sadie (Ed), 2001; Wishart, n.d.e).

## 3.2.    Electroacoustic Compositions

*Journey into Space*, probably inspired by at the time relatively recent event of the moon exploration by Neil Armstrong, was composed during the years 1970 to 1972, and draws an analogy between the advent of a voyage through space, namely the initiation of the journey, the journey itself, and the eventual arrival at the

destination, and that of man's passage through life. Although the techniques used probably seem unsophisticated by current standards, the composition is held in high esteem as a significant work with respect to the time and the genre to which it belongs (Couture, n.d.a).

*Anna's Magic Garden* (1982), centred on the voice of Wishart's three-year old daughter, strives to see and hear the world through the eyes of a child, and endeavours to represent those sounds and sights as perceived by one who has as yet not been familiarised with, nor formed any opinion on, those which others would treat as commonplace (Harley, 2003; Couture, n.d.d). Snippets of words, peals of laughter and snatches of song are intermingled with other sounds, depicting the intriguing and bewildering, yet inquisitive and innocent world of a young child (Harley, 2003; Winkler, 1990).

In a way similar to how *Anna's Magic Garden* illustrates a little girl's reactions to her experience, *Blue Tulips* (1994) uses recordings of an old woman's narration of her dream, and with the material gleaned from the narrative itself being transformed in various ways, portrays an emotive documentary of the woman and her circumstance. For Wishart, the identity or the distinctiveness of the individual was of much importance, as were the associations construed by the listener, and thus the intention behind both these compositions was for the respective subjects of each to be perceived as "reacting to special events in their lives, events which resonate with our own experience." (Harley, 2003: 102).

With much the same importance attached to the individuality of the subjects, but with the rationale to "recreate and transform the voices of well-known public figures in order to comment on them or their social context.", Wishart composed *Two Women* in 1998, and *American Triptych* in 1999, both of which demonstrate this aim, while also revealing the composers' continued interest in public-domain sound events, by the of use sonic material acquired from famous personalities and broadcasts of related news items (Harley, 2003: 102-103). *Fabulous Paris* (1997), based on a game show's enticement of a holiday in 'fabulous' Paris, alluding to the attraction that large cities hold for people, contrasts stylistically and structurally with *Two Women*, where in the former, Wishart appears to be more engrossed in focusing on the transformational processes themselves than on advocating the individual characteristics of the source of the subject matter, as is the case in the latter (Young, 2000).

In four movements, *Two Women* (1998) is for the most part based on the voices of Margaret Thatcher and Princess Diana. During the course of its progression, the work draws attention to the very disparate personalities, accentuating the differences in character of the two women (Wishart, n.d.d; Harley, 2003; Couture, n.d.d; Young, 2000). The first movement, *Siren*, depicts a train station, and leads into, and performs modifications on, the voice of Thatcher citing from St. Francis of Assisi, "Where there is discord, may we bring harmony." The second movement, *Facets*, builds upon the transformations of comments made by Princess Diana, while the third movement, *Stentor*, elaborates upon a plea by a Northern Ireland politician, Ian Paisley, saying, "Oh God in wrath, take vengeance upon this

wicked, treacherous, lying woman...". The final movement, *Angelus*, re-establishes Princess Diana in the centre of focus, with the words "I want to be the queen of people's hearts.", with the piece being wrapped up by the train station sounds heard in the opening section (Harley, 2003: 102).

*American Triptych* (1999) is similar to *Two Women,* in the sense that this piece too is based on famous personalities, but with American public figures instead of British. The "American Dream" is presented as seen by a European, the concept being personified by Martin Luther King, representing "liberty", Neil Armstrong, representing "technological progress", and Elvis Presley, representing the "pursuit of pleasure" (Harley, 2003: 102; Couture, n.d.d). The first section is centred on Martin Luther King, treating and building up on his quotation, the second section on Neil Armstrong, opening with bits of the famous relay from the surface of the moon, "The Eagle has landed", while excerpts from Elvis Presley and other sources are progressively introduced and intermingled, resulting in a remarkable piece of music (Harley, 2003: 102-103).

### 3.2.1. Red Bird

*Red Bird – A Political Prisoners' Dream*, composed during the years 1973 – 1977, uses the sounds of birds, animals, words and mechanisms (Wishart, 1992), and expresses the composers' interest in sound sources and the potential for modification of one sound to another (Couture, n.d.b; n.d.c). According to Wishart (1992), the sounds were transformed from one to the other by means of various processes, all the while taking care not to distort them beyond recognition. As he

wrote, his "...aim was to make sure the sounds were always recognisable, and to organise them in sound landscapes. These landscapes might be surreal or ambiguous, but they are never abstract." (Wishart, 1992).

According to Wishart (1992), *"Red Bird* is not only a piece of music, but also a journey into an alternative world." Sounds dominate the entire experience of listening to the piece. Gone are the visual distractions, and gone are all the 'unnecessary' extra goings-on associated with music performed live in a concert hall, leaving the audience with all their senses focused on the vibrant atmosphere created by the sounds themselves. He also says that *"Red Bird* is both a piece of music and a mythic retelling of the world", and goes on to hint that structurally the piece is based on the precepts of 'open' and 'closed' perceptions of reality, adding only that "such interpretations of reality are complementary, rather than conflicting – all reflect a 'deep structure' represented by the myth (Wishart, 1992).

In *Red Bird*, the underlying political notions are brought to the fore and are focused on by the dynamic movements of the sounds themselves. Oppression, or subjugation, and release, or liberation are pondered over by sonic transformations. Words struggle to be 'liberated' and sounds of animals and body sounds agitate endlessly, seemingly ensnared within some great complex machine (Young, 2000). Imbued with complex ideas, the piece is realised using a limited array of sound sources or, as Wishart labels them, 'sound-symbols', namely *bird* (sounds of selected bird calls), *animal / body* (sounds which include breath sounds, fluid sounds, and incoherent vocal sounds), *words* (sounds of spoken words, including

the phrase 'listen to reason'), and *machines* (sounds created from those sounds in *words* and *animal / body*). In addition to these basic sound-symbols, a few other sounds, such as the sounds of a clock, a book, a fly, and a door, are also used (Wishart, 1992).

The sounds were transformed from one recognisable sound to another, or morphed, by using *sequential transformation*, where one sound is reiterated, with each reiteration incorporating more and more of the second sound, and less and less of the first sound, and *continuous transformation*, where a continuous sound gradually changes into another identifiable sound, with no pause or break in between (Wishart, 1992). Wishart considers the transformations used in *Red Bird* to be among the first successful transformations that he was able to produce (Wishart, 2000b). Over a period of four years (1973 to 1977), using analogue tape, tape recorders, razor blades and a mixing console, he worked on the composition in the York University Electronic Music Studio, during the early hours of each day, a time in which the studio was not being used by students or staff of the University (Wishart, 1992).

The actual procedures to achieve the transformations, or morphing, from one sound to another that formed the structure of the piece were developed and expanded upon during the course of the composition. The limitations of the technology available at the time, and the extended vocal techniques that Wishart had experimented with while working as an improvising vocal performer were factors that had a direct bearing on how the piece eventually turned out (Wishart, 1992;

2000b). Another contributing factor was a nocturnal walk through a nature reserve, where the sound of leaves being rustled by birds frightened into flight proved to be an important aural experience that had a significant impact on Wishart's subsequent attempts at sound morphing (Wishart, 1992).

Determining which transformations could be achieved in practice, and which of those could be used in the piece proved to be a daunting operation, in terms of experimentation, as well as in terms of the magnitude of sound sources that were amassed. An interesting side development arising from the sheer volume of recorded sounds waiting to be listened to was the increasing necessity for developing practical methods of organising and categorising the sound data in a way that would enable the composer to accurately locate the sound that he required (Wishart, 1992).

After methodically assessing and evaluating the possibilities in which the sound-symbols might be made to interrelate with each other and with the general structure of the piece, and also ascertaining the limitations of the available equipment in terms of practicality, the sound-symbols were at length placed in associations based on context, in ways that would be conducive to intricate implicative and suggestive imagery in the minds of the listeners. The overall form of the piece consists of a number of sections, with each section having a specific sound-symbol in focus in the forefront, while the dynamic motion of the piece is controlled by the rate and intensity of the occurrence of events (Wishart, 1992).

John Young (2000), in *Letting the Ordinary Shine Through: British Acousmatic Music*, an article published in the journal of the Sonic Arts Network, lauds *Red Bird* as being a great success in facilitating the acceptance of sonic composition as a channel of creative expression in its own right. This is evidently attested to by the fact that *Red Bird* was awarded a prize at the Bourges Festival of Electro-Acoustic Music, held in France in 1978 (Wishart, 1992; Couture, n.d.c), and further by the fact that the piece has since been broadcasted in many countries, and has been played in concerts in venues in Europe, USA, Japan, Australia and Cuba (Wishart, 1992).

### 3.2.2. Anticredos

*Anticredos* (1980) is written for percussion instruments, and two female and four male amplified vocalists, and requires the use of a wide range of extended vocal techniques; techniques based upon Wishart's experience as a free lance improvising vocal performer, and years of research into the capabilities of human voice (Wishart, 1992). On hearing the piece, the voices appear to be manipulated by electronic means, whereas in actuality no electronics other than amplification are used, and that too for purposes of projecting perceptions of spatial depth and movement. The percussion are used only occasionally, to emphasise certain instances (Wishart, 1992; Couture, n.d.b).

With the conviction that the human voice was the most flexible and expressive of all music instruments, Wishart elicits a whole array of new vocal sounds, directing the performers to transform one sound to another, sometimes as a seamless,

continuous process, and other times as a progression of carefully calculated steps (Sadie (Ed), 2001; Wishart, 1992). Beginning with the singing of the word "credos", the piece progresses through numerous transformations on the individual sounds that constitute the word, and unfolds to finally reach its conclusion in regions far removed from those that it started in (Wishart, 1992).

### 3.2.3. Tongues of Fire

In the words of the composer, *Tongues of Fire* (1994) "explores our human aspirations and absurdities, through the musical transformation of the human voice." (Wishart, 1994b). All the material used in the piece is derived from a single sound source, namely the vocal utterance right at the beginning of the piece (Wishart, 1994b; Cummings, 1997: 97). The concepts of the voice as the most flexible and expressive of musical instruments, and that of the mutability of vocal sound sources through transformation and morphing are embodied in this piece, highlighting Wishart's continued fascination with the capabilities of the human voice, an interest whose scope is now inevitably extended into the realm of digital manipulation of sound (Young, 2000).

The capability of using the computer to digitally manipulate sound has made it feasible and practical to achieve the metamorphosis of one sound into another, and given the perceptible relationships between the resultant sounds, the potential exists for one to create a viable musical structure from those sounds. While professing to be not very concerned with trying to establish an exact correlation,

Wishart does liken to some degree the structural aspects of *Tongues of Fire* to the structure of more conventional musical compositions (Wishart, 2000a).

In three main sections, the piece opens with the "theme", closely followed by a repetition of the theme, and variations on the theme, much akin to the way a conventional instrumental work might set out a motif, perform variations, and subsequently develop it, and so on. In addition to further developments of the theme and its variations, phrases are built up from the thematic material, statements are put together from phrases, and phrases and statements are extended and developed, sometimes in ways independent of the original material. Distinctly familiar sounds are quite often heard in the 'melodic' detours, the rhythmic variations, the deviations of 'tempo', and the timbral modifications that are occurring throughout the piece, with recapitulation of material presented before, and the presence of a 'coda' serving to strengthen the idea of similarity to conventional forms. (Wishart, 2000a: 22-30).

Immediately following the theme and its reiteration is the development of the theme, in various ways, and these developments too are reiterated, with the theme now diverging into different directions. The section ends with a sound like the ticking of a clock, the resultant sound of numerous transformations being performed on the vocal sound. A brief lull in the sound, and then starts the second section, where the theme recurs, followed by rhythmically varied versions of the theme, variations which prove to be very important elements in shaping the ensuing development, and in maintaining cohesiveness of the structure of the

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piece. Towards the end of the piece, materials from the preceding sections are recapitulated, culminating in a coda featuring a fragment of the main theme (Cummings, 1997; Wishart, 1994b; 2000a).

The theme of the piece is a recording of a meaningless exclamation, in the composer's own voice. On the premise that a "metamorphosis must lead to a perceptually similar sound", Wishart transmutes the starting sound into many interrelated sounds, choosing from these sounds certain ones to use in the piece, and altering the others further, and so on. Through this process of generating interconnected sounds that possess similar sonic characteristics in varying degrees, a collection of potentially usable sound events are compiled. While at times the decisions about which sounds eventually are used are dependent more on their audible qualities than on the preceding series of sounds from which it was spawned, some sounds are chosen on the basis of their potential as a link between sounds, much like a passing note is used in conventional music (Wishart, 2000a: 22).

Lest the sound transmutation process becomes much too complicated and the results become too random and unconnected, Wishart has developed generative processes that are specifically designed to render transmutations that have some degree of audible relationship with each other. The sounds thus compiled are set out sequentially or superimposed, so as to assemble the phrases and statements that make up a structure that develops over time. According to Wishart (2000a), in an article in the *Computer Music Journal*, sometimes the phrases were worked out

during the alteration process itself, with these preordained phrases and the phrases resulting from the sequencing or superimposition process themselves being put through subsequent transmutations.

Perhaps an essential requisite in appreciating Wishart's compositions and the processes involved in bringing them to fruition would be an understanding of his use of new terms specifically coined to describe the new concepts and techniques that he uses in his compositions; terms that are consistently referred to in his books, his journal articles and in other forms of documentation, such as the liner notes of his compact discs. Some of these terms include *sonic node,* to mean the sound which is taken as the starting point in a transformation process, *pitchness* and *pitchal*, terms used to indicate that a sense of definite pitch can be attributed to a sound, and to differentiate that attribute from the usual implication of harmonic pitch (Wishart, 2000a: 22-30).

In his notes on the compositional process of *Tongues of Fire*, Wishart makes an important distinction between the terms *metamorphosis* and *transformation*, where the former is used to refer to the treatment of a sound to spawn correlated sounds, while the latter is used to denote the development of a sound through time. A further distinction is made between a *perceptual* metamorphosis, which simply put, is a process which alters a sound to result in an audibly similar sound, and a *technical* metamorphosis, which effectively alters the sound, but generates a resultant sound that does not resemble the starting sound (Wishart, 2000a: 24).

As an extension on this line of thought, Wishart reasons that in practice, it is not absolutely vital that the sequential order of perceptual transmutations be maintained, since it is possible to use a different sequence of events yet sustain the perception that the temporal order is intact. While this may be so, Wishart also considers it very important that the listener is able to relate the events being unfolded to a "source sound" from which the material is being derived from. That is to say, sounds should not be altered in so drastic a way that their fundamental characteristics are diminished or obscured to the extent that the listener is unable to recognise the events in the way the composer intended, namely as a process of theme, variation and development, thus making the whole endeavour futile. Or, as Wishart puts it, "No matter how abstracted from reality our sounds may be, we will still tend to attribute material and dynamic causation to them that is based on our experience of sound in the real world." (Wishart, 2000a: 24).

In *Tongues of Fire*, Wishart is seen to have adhered to this principle as, for example, when the opening theme is varied almost immediately after it is introduced. The variation is brought about by significantly time-stretching the sound, but leaving the initial attack intact, so as to sustain the perceptual link with the sonic node. With subsequent stretching, the audible features of the stretched part of the sound become metallic in quality, resulting in an event that starts as a distinctively vocal sound, constantly changes and acquires other qualities, and ends in a metallic sound (Wishart, 2000a: 25).

Named *voismetal*, in keeping with Wishart's practice of labelling sound files with names that are readily identifiable in terms of what they sound like, this sound event itself now becomes the sonic node for many subsequent transmutations, and is one of three main variations of the theme, the other two sonic nodes being *gablcrowd* and *pichstak*. The *gablcrowd* sonic node is devised by overlaying several different replicas of the theme, each deviating from the other through time, resulting in a sound resembling the sound of a restless throng of people. The *pichstak* sonic node is built up by overlaying several replicas of the vocal attack sound, these too differing from each other, but this time digressing in pitch. These sounds are superimposed in a way so that they begin at the same instance, resulting in enhancing the previously obscured pitch of the event (Wishart, 2000a: 24-25).

Acclaimed by critics and reviewers as a remarkable and very impressive work, *Tongues of Fire* was awarded the *Golden Nica* prize at the *Ars Electronica* competition in 1995 (Couture, n.d.c; Harley, 2003; Wishart, n.d.g). The use of ground-breaking techniques, ensuing in novel and ingenious sounds that induce powerful imagery in the mind of the listener, provide for an intriguing piece of music, as well as serving an intellectual function in providing a valuable insight into Wishart's approach to, and attitude towards electroacoustic composition (Couture, n.d.d; Cummings, 1997; Harley, 2003).

## 3.3. Wishart at IRCAM

Since completing *Red Bird*, Wishart came to realise that the transformation procedures that he had developed with analogue equipment, basically just tape

editing, speed manipulation and mixing, could be more effectively produced with more powerful features were he to utilise computer processing, and to this end he submitted to the *Institut de Recherche et Coordination Acoustique / Music* (IRCAM) in Paris, a project proposal for a work involving vocal transformations. Upon being accepted into the induction course, Wishart went there in 1981, but due to major overhauls of the equipment being undertaken at that time at the facility, did not start work there until 1986 (Wishart, 1988; 1992; 2000b).

At IRCAM, Wishart was exposed to the immense potential of procedures such as *Linear Predictive Coding*, and the CARL *Phase Vocoder* (Wishart, 2000b). Linear Predictive Coding (LPC) is a subtractive synthesis process that analyses and re-synthesises sound. Sounds of speech have in particular been treated extensively using LPC. Using LPC, a sampled sound is analysed and reduced to an approximation. The excitation and resonant functions inherent in speech are separated, thereby allowing independent manipulation of the rhythmic, pitch and timbral elements of the original sound. The Phase Vocoder (PV) is an additive synthesis process that analyses and re-synthesises sound by converting a sound sample into a set of frequency and amplitude curves. By editing the data thus produced, a variety of transformations can be affected on the sound sample, including manipulating the duration of the sound without perceptibly altering the pitch (Roads, 1995).

## 3.4.   The Composers' Desktop Project

From the time that he started using computers to compose, Wishart had had a keen interest in developing compositional tools for use in computer-assisted composing, and making them generally available to anybody who wanted to use them (Couture, n.d.c; Wishart 2000b). Having worked with the LPC and PV procedures, and having developed a number of processes for sound transformation based on those procedures, the most notable among them being spectral manipulation and spectral interpolation processes, Wishart collaborated with like-minded composers such as Andrew Bentley, Archer Endrich, and Richard Orton, and developers like Martin Atkins and David Malham, and during the years 1986 and 1987, embarked upon the *Composers' Desktop Project* (Wishart, 2000b).


The Composers' Desktop Project (CDP) was a vast project which aimed to make computer music tools available to any person or institution that wished to utilise them. Using Richard Moore's CMusic and the Mark Dolson Phase Vocoder as a basis, the project was implemented first using a desktop computer, the Atari ST. Subsequently, as computer processors and other hardware improved, over the years the software was moved to other platforms, such as the Atari TT, the PC, and the Macintosh. Although the software was initially set up to work with command-lines, graphic interfaces were developed later, one such interface being the *Sound Loom* written by Wishart (Wishart, 2000b).

### 3.4.1. The Instruments

Albeit in a brief manner, some of the instruments of the CDP deserve to be mentioned here, since Wishart has, over the last thirty years, devoted much of his time to developing, and helping to develop many of them, and also because they undoubtedly provide valuable insights into the compositional processes that Wishart frequently uses. *Audible Design: a plain and easy introduction to practical sound composition* (1994), and *Computer Sound Transformation: a personal perspective from the U.K.* (2000), an online article by Trevor Wishart addresses these processes in much greater detail than presented here.

*Spectral Morphing* creates a smooth transition from one sound to another, *Spectral Shifting* renders a harmonic spectrum into a non-harmonic one, or shifts the pitch while keeping the harmonic relationships between the sounds intact, and *Spectral Stretching* renders a harmonic spectrum into a non-harmonic one, but through a relatively more complicated process. *Spectral Cleaning* removes designated parts of the spectrum, *Spectral Banding* divides the spectrum into bands, *Spectral Tracing* retains channels designated by amplitude data, and *Spectral Blurring* averages frequency data over time, and deliberately obscures the clarity of the sound (Wishart, 2000b).

Other spectral transformation procedures include *Arpeggiation of the Spectrum, Spectral Plucking, Spectral Freezing*, which prolongs designated parts of the spectrum, *Spectral Interleaving* which intersperses data from other sources into the original spectrum, and *Tune Spectrum*. Also around this time, various spectral

filters, such as low pass, high pass, band pass, notch and graphic EQ filters, as well as quantising, shifting, vibrato, approximation, randomisation, exaggeration, inversion, and smoothening procedures for transforming pitch data were developed by Wishart (Wishart, 2000b).

In addition to the spectral transformation instruments, Wishart developed a number of what he terms 'time-domain' procedures. These include *Waveset Distortion* (where a 'waveset' is defined by Wishart as that part of the signal between any two consecutive zero-crossings) which replaces each waveset with a standard waveform, *Waveset Averaging*, which extracts and averages the shape of a waveset over a group of contiguous wavesets, and *Waveset Repetition*, which generates pitch artefacts through repetition of a small selected portion of a complex waveform (Wishart, 2000b).

As is so often the case, obstacles arising during the course of the compositional process served to spur Wishart on to develop techniques to circumvent the problems. For example, the difficulty of achieving realistic results with time-manipulation of iterative sounds, where the attack occurs not only as the initiation of, but as a series of events within, the sound, prompted the development of the *Iteration* instrument, which allows the user to control the rate, timing and duration of multiple time-stretching operations on the sound source. *Grain Manipulation* instruments were developed to manipulate tiny slivers of sound fragments in various ways. According to Wishart, both these procedures were developed and used during the composition of *Tongues of Fire* (Wishart, 2000b).

Another effect used in the same composition was achieved by *Sound Shredding,* an instrument which allows for the cutting up of a sound and rejoining of the segments in any order, any number of times. Vocal material is shredded at random points, shuffled, and put back together again, the whole process being repeated hundreds of times. Eventually, the original sound starts to degrade in quality and clarity, and while noise-like qualities become exaggerated, the multiplicity and complexity of the vocal characteristics are retained, resulting in a sound similar to the sound made by water coursing around rocks. In *Tongues of Fire,* Wishart uses this water texture as a backdrop against which other events take place, and also as a means of transition into another section of the piece (Wishart, 2000a: 28; 2000b).

An important instrument used extensively by Wishart in all his sound compositions since 1986, is the *Texture Generation* instrument, an instrument that generates events based on any number of sound sources fed into it. A variety of parameters, such as the density of events within the texture, the rhythmic regularity or irregularity of events, the accuracy of the occurrence of events, selective usage of source sounds, the modulation of the pitch of events, amplitude modulation of events, the durations of events, spatial imaging, spatial motion, and spatial texture are able to be controlled by the instrument (Wishart, 2000b).

In addition to those instruments outlined above, Wishart has developed many other instruments, and as well as continuing to make these generally available to all, he has made valuable contributions in improving on and extending the features of

processes initiated by others. *Brassage* techniques developed by the *Groupe de Recherche Musicale* of Paris were adapted to the CDP program, with some modifications by Wishart. Incidental unexpected effects arising through using certain processes in the original techniques were made more accessible and manageable for users, including modifications that afforded the manipulation of time and pitch at a granular level (Wishart, 2000b).

For amplitude modification, Richard Orton's *Envelope Extraction and Superimposition* procedure was further developed by Wishart, and subsequently offered as *Envelope Manipulation, Envelope Warping,* and *Envelope Replacing* instruments. Envelope Manipulation allows for the extraction of loudness contours of smaller individual events within a larger sound event, as well as the extraction of the overall loudness envelope of the entire sound. Envelope Warping is used for the manipulation of the extracted envelopes, and for the overlaying of the modified envelope onto the original sound, or onto another sound. An extremely useful tool for composers working with sound events, the Envelope Replacing instrument first neutralises the effect of the original effect, that is to say, it modifies the original sound to have a flat amplitude response throughout, and then imposes a new amplitude envelope on the sound (Wishart, 2000b).

Developed during, and used in the composition of *Fabulous Paris* (1995-1997), the *Filter Varibank* instrument applies a time-variable filter over a specified range of pitches and their harmonics and allows for the control of the amplitude of those frequencies. By modifying an algorithm devised to synthesise plucked-string

sounds, the Karplus-Strong procedure, Wishart developed a process to impose the effect of a plucked attack onto existing sounds, a process which he uses in *Tongues of Fire* (Wishart, 2000b).

According to Wishart (2000b), all of his mixdowns are carried out using the *CDP Submix* instrument, which has been further developed by working out extensions of the work by Andrew Bentley and others working on the CDP. In addition to its basic function as a mixer routine, the Submix instrument affords the user extended functionality by allowing for the reassignment of sound sources and the variation of timings for these events, as well as a number of more advanced functions such as the capability to synchronise events at any point, the capability to synchronise event attacks, and a procedure to use automated cross-fading between sound events.

Furthermore, Wishart has devised a large number of processes which are of particular use in his work on sonic compositions; processes such as one which examines and extracts certain key sound events from a recorded source, and ones which evaluates similarities between sounds, and ones which measure and balance sound levels, as well as processes that change the width of the stereo field and inverts the phase of the sound. He has also formulated processes that facilitate the generation and modification of streams of data, and processes that generate and affect random inflections on existing data, a process used in *Birthrite – A Fleeting Opera* (2000) in collaboration with Max Couper (Wishart, 2000b).

## 3.5.    Publications

Wishart's two books on sound transformation: *On Sonic Art* (1985), and *Audible Design – A plain and easy introduction to practical sound composition* (1994), have had a significant impact on defining the domain and technique of the relatively new area of sound composition (Sadie (Ed), 2001: 449; Couture, n.d.). In the book *On Sonic Art*, Wishart explores the realm of computer-assisted sound composition, in general the manipulation of sounds and "cinematographic use of soundscapes", focusing in particular on the concepts of *sound landscapes* and sound transformation in the area of sonic composition (Sadie (Ed), 2001: 449).

With recorded musical examples, the book Audible Design examines in great depth the practical applications of the processes developed for sound transformation (Monda, 1996; Puckette, 1996; Sadie (Ed), 2001: 449). Stating that "The assumption in this book is that we are not confined to defining instruments to arrange on some preordained pitch / rhythmic structure, but may explore the multidimensional space of sound itself, which may be moulded like a sculptural medium in any way we wish.", Wishart bases the book on the precepts that a musical composition may be initiated by any sound, that the possibility exists for any transformation or modification to be performed on this sound, and that musical structure, the crucial factor that holds the composition together, is essentially contingent on setting up perceivable audible connections between sounds (Monda, 1996: 108).

Interestingly, Wishart propagates the view that sonic composition is almost entirely dependent on the processes that one puts the sounds through, that is to say, how and what a specific sound develops into, and the characteristics associated with that sound are all products of the compositional process. The characteristics so developed are not foreseen by the composer; rather, it is all part of the discovery within the act of composing. According to Wishart, this view of sonic composition is dictated by the hitherto unattainable feats of sonic manipulation that computer processing now affords. The inevitable conflict that results between traditional concepts and this novel notion, as well as the composers' inner contemplation on this incongruity is discussed at length during the first part of the book (Monda, 1996).

During the course of the book, interspersing new terms devised to express new techniques and concepts, such as "waveset", "spectral focusing", "spectral stretching", "spectral freezing", "spectral fission", "spectral shaking", "spectral shifting", and "partial tracking" among others, Wishart lays bare the techniques and various individual traits that he has acquired through his work, and documents and elucidates on those transformation processes that can be achieved on sound sources. In a practical manner, elaborate explanations of processes are given, with constant references to specific effects and techniques used in his compositions, recordings of which are provided in the accompanying compact disc, as sound examples, and additional documentation on the techniques are provided in a separate appendix (Monda, 1996: 108; Puckette, 1996: 109-110).

# Chapter 4  *Smalltalk* and *Vox 5*

## 4.1.    Paul Lansky : *Smalltalk*

Crafted by means of applying filters onto a recording of a conversation between the composer and his wife, Hannah MacKay, *Smalltalk* (1988) invokes a sonic world where the rhythm and the melody of speech and the sounds of laughter are all mingled together to form a remarkable collage of sound, with plucked-string sounds set against a backdrop of soft chorus-like sustained harmonies (Garton, 1991; Rothstein, 1991). With features typical of normal speech, such as subtle vocal inflections and the occasional sibilance, but with no intelligible words in evidence the result is somewhat like snatches of conversation heard through a light sleep, or heard in a dream-like state of consciousness (Olewnick, n.d.). Evidently Lansky's experience of falling asleep in the car, while the sound of his parents conversing, and the sounds from outside all mingled together to form a lulling sensation was a significant source of inspiration for the overall texture of the piece (Garton, 1991).

Speaking of an interest in the 'inner voices' of simple things, Lansky maintains that his aim was not to make the complex seem simple, but rather to bring to the fore the inherent and seemingly inconsequential elements within simple things. Professing that sometimes the substance of a conversation is not nearly as significant as the way in which it is imparted, Lansky's main objective in composing *Smalltalk* was to highlight the innate components within the conversation between him and his wife, or to enhance the "inner text" of that

conversation, by inducing the listener to view the rhythmic and melodic contours of speech from a different perspective (Perry, 1995).

Approached from an angle different to that of the *Chatter* pieces, *Smalltalk* also confronts the listener with fragments of unintelligible speech. In *Smalltalk*, a recording of a conversation between Lansky and his wife are processed, and used to activate musical filters, with the aim of presenting speech as a type of music (Perry, 1995). The filters generate a stream of plucked-string sound events, providing a rhythmically dynamic foreground layered on top of a quieter and slow-moving harmonic background (Rothstein, 1991). Following the contours of speech, the sounds generated into the foreground are generally diatonic and strongly rhythmic, and greatly obscures the actual words being spoken, resulting in a musical representation of the general feel and gist of the conversation (Lansky, n.d.).

Lansky has written that to effectively comprehend works that have words embedded in a musical environment required the listener to be concurrently receptive to both the verbal as well as the musical implications being proffered, and that a certain amount of conscious effort is needed in the attempt to follow and understand the verbal content therein (Lansky, n.d.). Elsewhere, Lansky has contended that extremely complicated pitch structures have been found to be much too onerous, from an acoustic point of view, on the listener, and that he had subsequently decided to provide an acoustically simplified texture alongside such complex material, not with a view to assert or to emphasize tonality as such, but

merely as a means by which one might 'anchor' oneself to a 'home-base', from whence one could, to retreat at will, undertake exploration of the intricate threads of sonic events (Cody, 1996: 23).

As such, the soft chorus-like sustained sounds in the background are, according to Lansky, "a place to let your ears rest when listening to the music of the conversation or attempting to hear the words behind it." (Garton, 1991: 116). As Garton (1991) postulates, the sustained sounds, with their subtle and languorously elusive harmonic movement, define the different stages in the gradual unfolding of the conversation, seemingly exposing and enhancing a hitherto hidden facet that embodies an underlying and unvoiced thread of the conversation.

The juxtaposition of an energetic and vibrant foreground against a restful and contemplative background imbues the piece with an expressive and captivating quality, in essence recalling the kind of complexity found in the *Campion Fantasies* suite (Rothstein, 1991). Lansky himself (n.d.) attests to this, saying that as in the *Campion Fantasies*, by being encouraged to lean forward to decipher, in vain, the actual words being spoken, the listener is compelled to hear "the implicit music in sounds which are assumed to be explicitly unmusical."

## 4.2. Trevor Wishart : *Vox 5*

### 4.2.1. Towards *Vox 5*

From very early on in his compositional career, the human voice and its characteristics, and the immense flexibility that the voice appeared to encompass had always held an attraction for Trevor Wishart. In particular, the unusual vocal techniques employed by different cultures around the world, such as the sub harmonic chanting of Tibetan monks, the storytellers in Japanese theatrical puppetry, and special techniques used in West Africa, the USA, and Europe, were of much interest to him (Wishart, 1990).

Consequently, Wishart engaged in much research on the capabilities of the human voice, listening and analysing the sounds made in different cultures and different languages, but more than anything, he devoted much of his time to exploring his own voice and discovering ways to manipulate sounds, thus building up a large array of extended vocal techniques and sounds (Wishart, 1990). Wishart's work as a freelance improvising vocal performer during the early 1970s served to further facilitate this process (Wishart, n.d.d). Some of the techniques being explored by Wishart at this time were used in *Beach Singularity* (1977) (Wishart, n.d.f), with subsequently developed techniques being used in *Anticredos* (1980) (Couture, n.d.b; Wishart, 1992; 1990).

Although he accomplished much in the way of vocal manipulation in those pieces, Wishart was dissatisfied with the scope of this method of vocal composition.

Convinced that of all the sources of sound, the human voice was the most unique and the most responsive, he embarked upon a more comprehensive and elaborate approach to vocal composition, a project of such a large scale that it was to go on for the next eight years, eventually culminating in six compositions collectively known as *The Vox Cycle* (Wishart, 1990; 1992).

### 4.2.2. The Vox Cycle

In 1980, Wishart set about to accomplish the task of musically addressing the notion of what being human entailed, with the intention of using the human voice as a basis for attaining this objective. With that notion as the theme of the cycle, each of the constituent pieces focuses on a different aspect of the theme, using different techniques of performance, different musical structures, and dealing with different facets of human experience (Wishart, 1988; 1990). According to the composer, *Vox 1* (1980-1982) initiates the cycle with sounds implied in the diverse myths about creation that abound in traditions and cultures all over the world, and *Vox 2* (1982-1984) reflects upon the natural world, while *Vox 3* (1985-1986), more rhythmically-oriented, is about the exhilaration associated with intellectual exploration and discovery, and *Vox 4* depicts the breakdown and eventual collapse of society. Given that the myth of *Shiva* had a strong influence on the entire cycle, *Vox 5* (1979-1986) very aptly represents the voice of Shiva, and *Vox 6* (1988) portrays the dance of Shiva (Wishart, 1990).

*Vox 1*, commissioned and performed by the group *Electric Phoenix*, is written for four amplified voices and quadraphonic tape. According to Wishart (1990), the

opening sequence involving the seamless metamorphosis of continuous vocal sounds was inspired by the growth and development patterns of life forms, namely the process of *mitosis* by which a living cell divides into two. In *Vox 1* the sounds on tape divide first into two, then become four spatially independent strands which interact and counteract with each other, eventually and gradually giving rise to the formation of speech. Scored using notational methods devised by Wishart, the vocal parts consist of a wide range of extended vocal techniques, with the impact of these sounds during performances being enhanced by meticulous spatial manoeuvring (Wishart, 1990).

*Vox 2*, also commissioned and performed by *Electric Phoenix*, is written for four amplified voices and stereophonic tape. The extended vocal techniques employed in this piece create a distinctive trait by the innovative use of vocalisations inspired by Japanese puppet-theatre, the vocal music of Mali, as well as techniques inspired by the sounds of birds and wolves. The taped parts consist of animal sounds and sounds derived from inanimate entities (Wishart, 1990).

Using mainly conventional notational methods, *Vox 3* is written for four amplified voices and quadraphonic tape, and was commissioned by *Sound Art at Mobius*, and performed by *Electric Phoenix*. The tape parts consist not of accompanying sonic textures, but rather of computer-generated 'click-tracks' which provide the necessary timings for the performers. According to Wishart (1990), the piece was inspired by Arthur Koestler's contemplation of Johannes Kepler's quest to understand planetary motion in *The Sleepwalkers*, and involves complex rhythmic

vocal variations interspersed with snatches of conversations between the performers.

*Vox 4*, commissioned and performed by *Electric Phoenix*, is written for four amplified voices and tape. With the tape part providing intercessions, the vocalists use extended vocal techniques specifically chosen for their capacity to portray and heighten the psychological aspects of the dramatise relationships between each other. *Vox 6*, commissioned by the BBC and performed by *Electric Phoenix*, is written for four amplified voices and tape. According to Wishart (1990), the piece was based to a large extent on the popular music of the 1980s, and is meant to be a depiction of the dance of Shiva, in a contemporary context.

### 4.2.3. Vox 5

The only totally electro-acoustic piece in the *Vox Cyle*, *Vox 5* is regarded as a significant milestone in Trevor Wishart's compositional career, marking the broadening of the scope of his techniques into the digital domain (Young, 2000). The piece depicts the voice of Shiva, as a "(super) human voice" (Wishart, 1988: 21) emanating, in live performance, from the centre of the stage. From the extraordinary sounds thus uttered, gradually emerge all the other sounds attributed to naturally occurring events, such as the sounds of crowds of people, the humming of bees, the neighing of horses, and sounds associated with other creatures, as well as sounds whose sources are less apparent (Rowe, 1992; Wishart, 1990). According to Wishart, these are "poetic images of the creation and

destruction of the world contained within one all-enveloping vocal utterance (the 'Voice of Shiva')." (Wishart, 1990).

Using Mark Dolson's *Phase Vocoder* program, which Wishart had encountered, and subsequently developed a great interest for, at IRCAM, as has been mentioned elsewhere in this discourse, and programs that he had developed himself (Rowe, 1992; Wishart, 1990; 2000b), *Vox 5* stands to represents a work of great success in the art of sound transformation (Rowe, 1992), and embodies the notion of the potential mutability of one sound to another, in a smooth and perceptually flawless manner (Young, 2000).

It is interesting to note that the initial vocal sounds used in *Vox 5* were themselves first produced using an assortment of extended vocal techniques, upon which various manipulations were subsequently affected using, in addition to processes like *Spatialization* and amplitude enveloping, processes such as *Spectral Manipulation* and *Spectral Interpolation* (Wishart, 1988: 21). Of these processes, the latter two were the major compositional techniques employed in composing the piece, according to Wishart's article titled *The Composition of Vox-5*, published in the *Computer Music Journal*, Volume 12, No. 4, Winter 1988.

Using the phase vocoder, the initial sound events were first analysed and split into a number of individual component channels, each channel consisting of a discrete range of frequencies and associated amplitude data. What this meant was that specific frequencies of the original sound could now be individually subjected to

any number of manipulations, entirely independent of the other component frequencies. For example, a specific frequency, or a range of frequencies could be targeted and treated so that that range of frequencies start at a lower pitch and gradually slide up to the original register during the course of the sound (Wishart, 1988).

Wishart refers to the spectral manipulations that he uses as *shifting* of the spectrum and *stretching* of the spectrum. In the former, the frequencies are shifted while maintaining the harmonic relationships between the constituent elements. In the case of stretching of the spectrum, while the frequencies here are also moved, the degree of movement of the constituent elements depends on where they were located in the spectrum at the start. Wishart asserts that in the interests of maintaining the 'naturalness' of the resultant sound, he uses the shifting procedure on sounds with a definite sense of pitch, and the stretching procedure on sounds more akin to noise (Wishart, 1988: 22).

One of Wishart's programs, *Specsh*, is used to first divide the spectrum into an upper and a lower part, and then manipulate either or both parts, to achieve spectral shifting and spectral stretching. Another program, *Specf*, is used to overlay an approximation of the spectral envelope of the original sound on the resultant sound, to offset any undesirable distortions of the formant structure arising from spectral manipulation, while *Spece*, an extension of *Specsh*, allows for non-linear stretching of the spectrum, thereby affording the composer the capability of producing concave or convex types of stretching. The development of this latter

program was necessitated by Wishart's objective of transforming a vocal sound into an inharmonic bell-like sound. Wishart achieves this objective by subsequent time stretching procedures, and here again, he takes great care not to alter beyond recognition the essential components, such as the attacks at the onset of the sound, which enable the sound to start off as being distinctly vocal, and end in a bell sound (Wishart, 1988: 22-23).

According to Wishart, certain features come built-in in his programs, to facilitate the retention of crucial attributes and the preservation of 'source-sound credibility' of the transformed sounds. For example, his programs allow for the establishment of envelope parameters, similar to the ADSR envelope of conventional electronic instruments, but here defined as *Attack, Divergence, On, Convergence, End*. The requested changes to the spectrum takes place during the *On* phase, while in the first and last phases there is no change, and in the *Divergence* and *Convergence* phases, to smoothen the transformation process, the spectrum is interposed with components of the original and the resultant spectra (Wishart, 1988: 23).

The major problem encountered in using *Spectral Interpolation* to affect the smooth transition from one recognisable sound to another recognisable yet different sound, in itself a relatively uncomplicated procedure when viewed from a purely computational perspective, was the necessity of carrying out many and varied manipulations towards deriving a perceptually viable result. This complication arises from various factors, not the least of which is the impediment

of perceptual associations and subconscious classification on the part of the listener (Wishart, 1988: 23-24).

With reference to the catastrophe theory, Wishart maintains that one is prone to perceive a continuously changing object as that which one first identified it as, until reaching a certain threshold, whereupon which there is an abrupt change in perception to accommodate the recognition of the new object. Wishart deals with such perceptual leaps by subjecting the transformed sound to another bout of manipulation, to emphasise a part of the spectrum and thereby bringing into prominence a seemingly independent stream of sound that spans the incidences of vagueness, thus effectively reducing the likelihood of a change in awareness and ensuring the perception of a smooth and seamless transition (Wishart, 1988: 25).

Another method of dealing with barriers put up by perceptual tendencies was to situate the transformed sound in a suitable context, one that would be conducive to realising the aims of the composer. According to Wishart, the very nature of *Vox 5* establishes the appropriate context for many of the sound events to be discerned exactly as they were meant to be and thus perceptual ambiguity is very minimal. For Wishart, transitions back to a vocal sound presented the most obstacles, than vice versa. This was overcome for the most part by ensuring that the starting sound, during its fading out phase, featured the same amplitudal and spatial characteristics as that of the fading in phase of the concluding sound, to ascertain that the entire event was aurally convincing (Wishart, 1988: 25).

In 'live' performance, *Vox 5* utilises four channels to bring about spatial effects that make the sounds appear to be emitted from a mouth in the centre of the stage, to physically spread out and circulate around the audience, and eventually retreat to the centre, whereupon another syllable is expelled from the source (Wishart, 1990; Rowe, 1992), all combined with a strong sense of drama and anticipation which encouraged the sustenance of interest on the part of the listeners (Rowe, 1992). Although unable, due to the technological limitation of facilities available at the time, to realise what he considers would have been the ideal choice, namely that of using the DEC VAX computer at IRCAM to spatialize the sound events, Wishart attained the spatial effects that he wanted during the mixdown process, using IRCAM's 24-track digital tape recorder together with a quadrapan device (Wishart, 1988: 25).

The concept of aural "landscapes" has always been of much significance to Wishart, as attested by his writings and by his electroacoustic compositions. From experience, Wishart holds the view that the effectiveness of spatial distribution in an electroacoustic piece of music depends to a large extent on the speaker system in use, the characteristics of the sound, and the location from which the piece is heard. That is to say, the number of speakers used greatly affects the perception of direction, change of bearing and motion, while the intended spatial movements are rendered more or less ineffective and imprecise, depending on how far removed the listener is from the anticipated focal centre of the projected sounds (Wishart, 1988: 25-26).

High frequency sounds and reiterative sounds being considered the most promising in terms of effective spatialization, Wishart pursues the prospects provided by such sounds to the full. The rapid vocal sounds, such as those that instigate the piece, are expelled from the centre and into the sound space around the audience, while sometimes the sound emanates from the centre and bifurcates and moves in independent spatial paths. As well as these, Wishart uses spatial motions where individual strands of sonic elements move in independent trajectories, aurally interacting with each other, creating a kind of contrapuntal motion (Wishart, 1988: 26).

Another significant trait involving the manipulation and transformation of sound that is seen to be of paramount importance to Wishart is the desire to create a "believable" sound. In other words, the transformed or manipulated sounds must always be perceptibly natural, even if they do exhibit some unanticipated characteristics during the actual process of sonic transformation and/or development, and it was to this end Wishart developed much of the transformational procedures and compositional processes that were ultimately used in his electroacoustic compositions (Wishart, 1988: 21).

An important technique used by Wishart to maintain the credibility of the sonic imagery in *Vox 5* was that of using accurate enveloping procedures, especially to create the perception of the opening and closing of the mouth when commencing and ending the vocalizations. For example, individual vocal sound events arranged to sound sequentially as consecutive words or phrases necessitated in the

overlaying of amplitude envelopes that would imply nuances normally associated with vocal sounds, such as the opening and closing of the mouth, and the preparation of the vocal cavity to enunciate the next word (Wishart, 1988).

# Chapter 5 Conclusion

Paul Lansky and Trevor Wishart, two extraordinary composers with extraordinary concepts and views, at times remarkably different from each other, in terms of compositional aims, methods of composing, and the compositions themselves, yet at times demonstrating areas of great similarity. While these have been addressed in the preceding pages in varying degrees of detail, in drawing this discourse to a close, there is the need to reiterate, albeit in a brief manner, facts pertinent to such similarities and discrepancies as exist between the two composers, as well as to concisely voice one's own views and observations.

Both Lansky and Wishart have used pre-existing sounds extensively in their electroacoustic compositions, and are much interested in the analysis and re-synthesis of sounds, especially those that are to do with the human voice. Having worked for years with computers, both Lansky and Wishart have elaborated upon the potential and the practicality of using the computer to manipulate sound in the digital domain to construct credible musical works; works with musical structures capable of holding their own with music composed by more conventional methods. On occasion, both composers have related aspects of their electroacoustic compositions to conventional notions, such as the implicative properties associated with tonality and tonal centres, textural ideas concerning foreground and background, and the concepts of theme and variation, development and recapitulation (Wishart, 2000a; Lansky, n.d.). While this outlook, as exemplified

by Lansky's *Chatter* pieces, and Wishart's *Tongues of Fire*, may hold true in some instances, the composers have had occasion to take differing positions on the subject of conventional methods versus computer-assisted methods of making music.

Lansky's position on the discrepancies between conventional notions of music and more recent trends is such that rather than severing all links with traditional notions in the hopes of 'liberating' the new musical concepts, he is more interested in utilising the expressive capacity of established conventional musical concepts to lend credence to and to augment the perception and appreciation of the sounds of the world (Perry, 1995). Similarly, Wishart too attaches much importance to the tendency of listeners to associate the component sounds of a musical work with their own experiences in the real world. As has been mentioned before, Wishart maintains the view that a listener will almost always mentally label sounds based upon past experiences, and will continue to identify that sound as such until the sound in question traverses a certain boundary, beyond which it is then perceived as a new sound (Wishart, 1988: 25).

Continuing along this line of thought, it is interesting to note Wishart's perspective on the similarities between existing compositional procedures and conventional notions, such as the parallels he draws between key modulation in established forms of tonal music, and "sonic modulation" in electroacoustic compositions. Taking the case where one sound seamlessly evolves into a different, yet recognisable sound through a process of continuous metamorphosis, Wishart likens

this process to that of key modulation in tonal music, where the musical material gradually moves away from one tonic region to a different, yet recognisable region. While conceding the fact that attributes of tonality and tonic space cannot be simply applied to sonic space due to the incongruent properties of both, Wishart puts forward the argument that it is entirely possible to create in sonic space an implied sense of movement similar to the tonic development associated with key modulation (Wishart, 2000a: 26), a point of view with which one can well concur.

Taking into account the fact that the listener is inclined to be more receptive to 'real-world' sounds, both Lansky and Wishart have used this predisposition on the part of the listener to their advantage. In this regard, Lansky has asserted that his intention was not to complicate the uncomplicated, but to offer a view of the ordinary from a different angle, and thus bring out the inherent richness and diversity of the material at hand (Perry, 1995), which otherwise would in all probability have gone unnoticed. Along with this compositional intent, also at the forefront of many of Lansky's works with speech is the challenge posed to the listener to attempt to lean forward to hear and to understand the words as in, for example, the *Chatter* pieces (Lansky, n.d.). Not too far removed from Lansky's position, Wishart's interest in using 'real-world' sounds appears to stem mainly from his desire to create believable, thus recognisable, sounds and aural "landscapes", while at the same time propagating the view that any sound had the potential to be altered smoothly and faultlessly (Monda, 1996; Wishart, 1988: 25; 1992; Young, 2000).

A parallel can be drawn with Wishart's concern for the credibility of sounds, and Lansky's views pertaining to the importance of the context in which a piece is listened to by the audience. According to Lansky, certain compositions require a more intimate setting than others, a setting that would be conducive to a more profound aural experience. Lansky's electroacoustic compositions, especially those using speech, quite often incorporate a complex texture, a juxtaposition of a lively and animated foreground against a more leisurely background, elements which compel the listener to lean forward and attempt to connect with what was going on in the music, thus making the act of listening a conscious one. As has been discussed elsewhere in this study, Lansky felt that music fated to be in a recorded format must have incorporated in it elaborate and complex layers of elements, so that there is a different thread to follow with each repeated listening (Lansky, n.d.), and in this regard, Lansky is seen to have succeeded. However, since Lansky's music of this nature can be quite aurally demanding on the listener, much of his music is generally not very favourable to situations where music is required to serve as a background element.

Wishart draws many analogies between his compositions and the real world and life in general, as well as touching upon mythical ideas and concepts of alternative worlds. As for example, in *Red Bird*, *Journey into Space*, and *Tongues of Fire*, he presents the listener with insights and perceptions of reality, likens the development of musical elements to that of man's passage through life, and evokes powerful images in the mind (Couture, n.d.a; Wishart, 1992; 2000a). In *Anna's Magic Garden* and *Blue Tulips*, Wishart puts across his interpretation of

individuals reacting with their surroundings and their circumstance (Harley, 2003), much like a documentary of sorts. In a similar fashion, Lansky too considers himself to be, in some ways, an interpreter of sounds (Roads, 1983), documenting and presenting the ordinary from an uncommon viewpoint (Cody, 1996), as exemplified by his works using speech. Also, in much the same way as Lansky likens himself to a sculptor (Cody, 1996), Wishart too contends that, with the aid of computer processes, sound may be "moulded like a sculptural medium" (Monda, 1996: 108).

As has been examined at length in this study, both Lansky and Wishart were of the belief that the human voice was indeed a remarkable sound source, capable of being used to create many and varied kinds of music. Along this vein, Wishart held that the human voice was the most expressive and flexible of all musical instruments, and to that end, researched extensively into the techniques of vocal manipulation, transformation and morphing, both with and without the aid of technology, the developments and findings of which he has meticulously documented and made available for any who wished to use them. Similarly, Lansky was firmly convinced that the voice, speech and music were interrelated, and as such, considered speech and song to be the extremities of the same spectrum, and has, in his compositions, treated the sound of speech as a musical object. From the research undertaken and discussed in the preceding sections of this study, one is able to attest to the fact that both Lansky and Wishart appear to have demonstrated their capability to utilise the intrinsic properties of the voice to augment their creative outputs.

However, while one is able to go along with Wishart's view that the basis on which a musical structure is built is dependent on the establishment of audible relationships between sounds (Monda, 1996), one tends to hesitate somewhat at the further assertion that the characteristics of a processed sound are not foreseen, but are reliant entirely upon the processes themselves and thus are part of the compositional process. Certainly, there would inevitably be instances when it is agreeable, even desirable to let the designated computer process take its due course, unchecked, so to speak, but rather than label and file this course of action under "discovery", one would be more inclined to regard this as compositional choice.

Furtermore, while one feels that it is not as significant as perhaps it once may have been a few decades back, for electroacoustic music to draw parallels with conventional types of music and compositional processes, the concepts of documentaries and sculpting as related to musical composition, especially as pertaining to composition in the digital domain, are undoubtedly notions worth entertaining. In fact, it would not be amiss to suggest that these concepts are now at the forefront in the field of computer-assisted electroacoustic composition. In a future study of this nature, it would perhaps be useful to follow up on these aspects of electroacoustic composition, in greater detail than at present.

With regard to the computer as a major component in recent trends of music, Lansky has put forward the view that technological advances are pointless apart

from the use that they are put to, and asserts that when people are more interested in the music than in the machine that was used to make it, and not vice versa as is the case at present, then will electroacoustic music be deemed to have fully emerged (Cody, 1996). While one is of the opinion that even in conventional music, there have been many instances where the instruments used in certain pieces of music have mattered enough to warrant comment, the significance of Lansky's observation should not nevertheless be ignored. This is in spite of the fact that as of yet there do exist discrepancies in the quality of works rendered by different calibres of equipment, and thus one feels justified in upholding the view that the machine used in the process is, as yet anyway, almost as significant as the music created on it.

On the other hand, although many and varied programs and techniques have been developed and enhanced to process sonic raw material, these programs do not differentiate between the purely computational and the musically and aurally viable results. In Wishart's opinion, an opinion with which one fully concurs, to be able to successfully accomplish that, certain decisions must still be taken by the composer; decisions based upon the composer's own musical and aesthetic values, as well as his or her own experiences in this field. In conclusion, one would assert that it is indeed an undeniable reality that the advent of computer processing allows for the exploration and experimentation with sonic material and acoustic phenomena in a greater detail and precision than has been possible before, while at the same time acknowledging with appreciation, and giving due credit to, the composers whose journeys and innovations in the face of technological limitations,

and whose efforts to realise their compositional aims are, directly as well as indirectly, responsible for the technological advances that have made this possible.

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