Sounds and sources in *Powers of Two*: towards a contemporary myth

BARRY TRUAX

School of Communication and School for the Contemporary Arts, Simon Fraser University, Burnaby, British Columbia, Canada V5A 1S6

Within the context of discussing contemporary music the European tendency to overvalue abstraction is questioned. The use of environmental sounds in electroacoustic music is highlighted as an example of the questionable value of abstraction. Attention is then focused on a recent Truax composition, *Powers of Two* (1995) as a work of electroacoustic music theatre. The historical musical and poetic references, as well as the sound sources adopted for the work, are discussed, and placed within the human framework of relationship embodied in the piece. A concluding section summarises the work as an attempt to create a contemporary myth from historical sources, and as a dramatic expression employing electroacoustic forces.

1. ABSTRACTION VS CONTEXTUALISATION

One of the dilemmas facing the contemporary music composer today, particularly a younger one, is whether and to what degree one should follow the largely European-based pursuit of abstraction as the goal and direction of art music. The questions raised by this dilemma range from whether, at the theoretical level, abstract thinking can continue to 'progress' indefinitely into the future without ecological constraint, to questions at a more pragmatic level, as to whether public funding of such artistic endeavours can continue to be justified. Given that abstract music has virtually no audience outside of its practitioners, and if not supported by the academy would probably not survive on its own, it would seem that such questions should be uppermost in composers' minds today. I suspect that the strong tradition of government subsidy for the arts has cushioned the perceived need of composers to address this question in continental Europe; however, in Britain and North America, the concept of public accountability and dwindling state support for the arts will no doubt force the issue first.

In a recent essay (Truax 1994a), I have argued that one approach to the dilemma might involve a re-examination of the concept of musical complexity which, in abstract musical thinking, may be understood as involving only the system of internal relationships between sounds. The process of abstraction has essentially detached sounds, not only from their sources, but also from any contextual reference which they inevitably have. Symptoms of the degree to which this detachment has been pursued may be found when one cannot identify the cultural origins of a piece of music or its composer (the artistic equivalent of the McDonald's hamburger), when the music can be performed by any professional performer at an eight o'clock concert in any hall in the world (the equivalent of watching your favourite prime-time sitcom on television via satellite in any country), and perhaps most insidious of all, when a listener in the audience, primed by a programme note, tries to 'understand' the music, ends up 'appreciating' the performers' attempt to play it, but does not 'feel' anything at all (a type of alienation more commonly ascribed to commodity consumption).

In the essay referred to above I argued that a renewed understanding of musical complexity might be based, first on 'external' complexity, that is, on any or all of the contextual specifics which might inform the composition, such as the physical, social and psychological levels. These aspects would not be treated merely anecdotally, or programmatically, but might be allowed to influence the composition at such a deep level that the piece would be unimaginable without those influences. In other words, the work is grounded in a specific context, one which provides an audience with a frame of reference for understanding it. The second and perhaps most important feature of a renewed concept of complexity is the necessity to relate the external to the internal complexity. In other words, the way in which sound and structure become integrated internally mirrors the way in which music and context are integrated externally. No formal theory of this process exists, to my knowledge, and composers, to the extent that they are concerned with this problem, tend to find intuitive solutions that are seldom generalised. A systematic re-evaluation of 'sounds and sources' may contribute to our understanding of this relationship.

The role of electroacoustic technology in this regard is intriguing and suggestive. With its usual ambivalence, this technology can be seen as assisting the detachment of sounds and sources precisely because of its 'schizophonic' nature (Schafer 1969), and its commercial use to commodify both the audio

Organised Sound 1(1): 13–21 © 1996 Cambridge University Press

artifact and the listening experience (Truax 1984, chap. 10). In fact, the ability of this technology to surround us with a surrogate, and now a quasi-virtual, aural environment may be its most profound effect on our daily lives. The ambivalence comes when we realise that the same technology may be used to extend our perceptions and enhance our understanding of the world, criteria which constitute my personal standard for recognising a net gain from the use of technology. Instances of such creativity are not exclusively found in the artistic practice of electroacoustic music, but rather in many forms of sound design usually located on the fringes of the mass media (Truax 1984, chap. 13).

The use of environmental sounds in electroacoustic music, which has been made increasingly feasible through samplers and signal processors, brings to a head in a rather unique way all of the issues which I have raised here. In another recent article (Truax 1996) I have summarised the difficulties which the use of such sounds poses, along with the gaps in the various disciplinary bodies of knowledge which it exposes – gaps that may largely be attributed to a narrow focus on speech and musical sounds to the exclusion of the more complex acoustic phenomena found in the soundscape at large. However, the more serious implication of the use of environmental sounds is the fact that they are inescapably contextual, unless transformed into an unrecognisable form, and thus a music theory based on abstract, parameterised relationships is powerless to deal with them. This article also summarises the twenty-five year history of work at Simon Fraser University in dealing with environmental sound, both as a social responsibility (which composers could be ideally suited to assume) and as a catalyst for developing a new artistic use of such sounds in what I call the 'soundscape composition'. However, I emphasised that the basic aim of acoustic ecology 'was not to further exploit the environment as a source of musical material, but rather to exploit the knowledge base of musical design in order to redesign the soundscape and to reawaken people's perceptual appreciation of its importance'.

Stated briefly, the soundscape composition is characterised most importantly by its refusal to separate sound entirely from its source and context. Although electroacoustic modification and transformation are almost always employed in a soundscape composition (along a continuum between 'found' sound with transparent manipulation through to a completely artificial recontextualisation), the listener's recognition and network of associations are an integral part of the composition. Of course, this insistence exposes our collective ignorance of the nature of aural cognition and the way in which environmental sound mediates the listener–environment relationship. However, the field of communication studies provides, in my experience, an ideal interdisciplinary basis for studying this aspect of society. The flow of influence can travel in both directions, from composer to environment in terms of social involvement, and back again in terms of compositional design (Truax 1992c). The ultimate goal of the soundscape composition is the reintegration of the listener with the environment in a balanced ecological relationship.

The tension for the electroacoustic composer in dealing with these issues comes from balancing Schaeffer's 'reduced listening' (*écoute réduite*) with Schafer's expanded 'soundscape awareness'. In classic acousmatic theory, the sound object is abstracted from its source as an object for perception that must be totally detached from the recognition and associations of its source (Smalley 1992). In classic soundscape theory, the sound event can only be completely understood in relation to its full social, psychological and environmental context which supports a network of meanings that habituated listeners have learned to interpret. The distinction in the two disciplines manifests itself right from the initial recording practice (isolating sounds acoustically from their context versus recording them *in situ*) through to the final product (an art of sounds fixed on a support medium versus an art of sounds whose communicative role entwines the listener's participation and hence is not *fixé* in any absolute sense).

Fortunately, the polarities between acousmatic and soundscape practice are not unbreachable, although they have historically developed on different continents and within different cultural circumstances. The acousmatic approach, for instance, has increasingly, particularly among the younger generation, embraced various means to address the audience other than purely abstractly. I understand the notion of *cinema pour l'oreille* ('cinema for the ears') as one such gesture toward providing a narrative or other contextual framework for the listener. And likewise, soundscape oriented composers have shown no hesitation to work with the same repertoire of transformational technology, usually with the implication that such transformations address the inner world of imagination, symbolism and metaphor which environmental sound can invoke.

I have described elsewhere my work with the granulation and time stretching of environmental sound (Truax 1988, 1990, 1992b, 1994b) which has provided a unique means of exploring the inner complexity of such sounds and relating that complexity to their symbolic function in the listener's experience. These techniques seem to provide an alternative to the industrial approach of processing 'raw' sounds into the commodity of sound effects. It also seems to open up a language of discourse based on associ-

ations, metaphors and symbols (Wishart 1985, 1986) which is as intellectually satisfying as abstract manipulation, yet more accessible in engaging an audience. My most ambitious effort to date in this direction has been to extend my work in tape composition to a piece of electroacoustic music theatre, called *Powers of Two* (1995), in which the symbolic functions of the sampled sounds are mirrored in the roles of the live performers who act out, not merely a story, but a series of symbolic relationships of hopefully universal applicability.

2. SOUNDS AND SOURCES IN *POWERS OF TWO*

Powers of Two is scored for two singers (lyric tenor and counter-tenor), female dancer, video tape and eight digital soundtracks. It is a piece of electroacoustic music theatre that explores the symbolism and dynamic tension between various pairs of opposites: the visual and auditory, the real and virtual, male and female, gendered and inverted. Although the characters are not intended to be realistic, they enact various human emotions in their search for unity. The lyric tenor's role, called the Artist, though played as a gay male, is symbolic of our common search not only for love, but spiritual fulfillment. He seeks guidance from the Seer (the counter-tenor), an androgynous figure who cannot walk or speak, but who dispenses wisdom through images and song, and eventually finds insight through blindness. The Dancer, on the other hand, seeks only a union with her virtual 'other', the dancer on the video tape (who is a female dancer in two scenes, and a male dancer in the other two). The work is structured around four scenes, each of which includes a video tape, and a historical musical and poetic reference. In order, these are the fifteenth century French tune, *L'homme armé* (The Armed Man); Monteverdi's *Combattimento di Tancredi e Clorinda* which tells the story of the Crusader prince Tancredi's battle with the Saracen warrioress Clorinda, in which he, not recognising his love, engages her in combat, kills her, and as she dies, he removes her helmet and discovers her blond hair; the Liebestod from Wagner's *Tristan und Isolde*; and the ending of Stravinsky's *Oedipus Rex* in which the blinded king is accepted by his people. Besides the sung text, poetic excerpts from Marino, Tasso, Cavalcanti and Rilke are heard.

Four types of sound sources were used to create the tape part:

(1) Musical excerpts of the four cited historical works sung by the counter-tenor in one of four languages (French, Italian, German and Latin), plus tones and short phrases sung by the counter-tenor and a female voice.
(2) Readings of the texts of the musical excerpts and the poetic sources, in the original language as well as in English, plus variants on those texts as needed by the libretto, spoken by both male and female voices.
(3) Pacific Rim percussion sounds, including gamelan, marimba, drums, a Chinese guzheng, gong and tam-tam, and an ocarina.
(4) Environmental sounds (rain, thunder, wind, cicadas and a church bell) recorded in Italy.

In terms of the above discussion, such a heterogeneous array of material might seem difficult to integrate, particularly since the sounds come from vastly different cultural situations and time periods. However, it was precisely the intent to find a common symbolic thread running through them all that was a motivating force behind their choice and use. Moreover, the way in which they were processed was intended to bring out their symbolism and give them a sense of timelessness that transcended their origins. Like the soundscape composition, the intent was not to obscure the origins of the sounds and texts, but rather to bring out their essential imagery in a manner that would be meaningful to the contemporary audience.

The central idea of the work is embodied in the title, *Powers of Two*, which plays on the mathematical meaning of the term (i.e. the number series achieved by multiplying 2 by itself an integer number of times, namely 1, 2, 4, 8, 16, . . .). This numerical set is used to determine all of the structural aspects of the work and its elements, and, of course, the binary number system is at the heart of the computer technology used to produce the music. However, the title also refers to the 'powers' or energies involved in the relationship between two entities, whether individuals or concepts. The pairings which are systematically structured in the work include the male and female characters (both live and on video) who appear as such in some scenes and inverted, i.e. cross-dressed, in others. The spoken voices on tape are often heard in various pairings of the four male and female speakers. In addition, the dancer and tenor represent the visual/kinetic and auditory sensory modalities, respectively, and each is paired with a virtual 'other' on the video and audio tapes. The auditory dimension is further subdivided into a dichotomy between spoken and sung text. The Seer, who cannot walk and is confined to a chair on a platform above the video screen, can sing but not speak; however, the Artist cannot hear or understand the Seer's sung text, and always creates his own version with the opposite meaning. Therefore, each character is incomplete in some way and yet involved in a search for unity, a unity that can be read as sexual, psychological, artistic or spiritual.

The energies that propel each character's search are the themes of each of the four scenes, with their accompanying emotions, namely, attraction and desire, conflict and remorse, loss and grief, and finally, reconciliation and acceptance. Each pair of themes mirrors the other, and the themes within each pair are complementary. The scenes are presented as a set of images (visual, musical and textual), ostensibly originating with the Seer, but transmuted and distorted through the perceptions of the Artist and Dancer. The images roughly follow the course of European artistic development in its various phases, and make reference to various archetypal figures and myths found in that tradition.

However, the musical and visual materials are digitally processed in order to remove them from any attempt at historical verisimilitude and render them timeless. For instance, the musical quotations, recorded by the counter-tenor, are heavily resonated using a double digital delay line with a high level of feedback (modelling two resonating tubes closed at one end with a near perfect degree of reflectivity). This processed sound is then time-stretched with the granulation technique referred to above such that the original and resonant pitches do not change, only the duration of the sound and the apparent volume of the space in which it appears to originate. The result is that the musical line sometimes retains its melodic contour, and at other times is stretched into long resonant tones that appear to be reverberated in a cathedral or other diffuse sound field. The resonances are often so strong that they resemble harmonic singing where overtones become clearly audible as pitches. In the performance, the counter-tenor frequently sings the same musical line against the processed one. The spoken English version of the text of the music is not resonated, but only granulated and partially stretched. In contrast, the independent poetic texts in each scene are resonated but not stretched. They are heard spoken in the original language while the Artist sings the same text in English.

The four video scenes are similarly digitally processed by Theo Goldberg, and each is photographed and edited in a different manner, according to a scheme devised by the choreographer, Thecla Schiphorst. The first shows the male dancer (the fourth 'virtual' character who never appears live) only in torso (hence larger than life size when projected). His character may be called Antinous, the favourite of Hadrian, because he becomes the object of desire of the two live performers, particularly as the camera follows his hands caressing his skin. In the second video, the female dancer is dressed as a male warrior in the role of Clorinda and acts out the story outlined above. The tape concludes with the scene of her death and the discovery of her blonde hair that reveals her true identity. In the third video, the male dancer appears dressed in female attire behind a slow motion scene of a fringed scarf being slowly drawn down, shroud-like, across his face which is revealed only at the very end with his eyes closed. In the final video, the female dancer is photographed from above which makes her appear to defy gravity when projected vertically. She wears a long, flowing dress that is eventually discarded when she re-enters the frame of the picture. The video processing creates a pulsing reddish arc that contrasts with the deep blue of the rest of the image.

3. CHOICE OF MUSICAL AND POETIC SOURCES

All of this structural use of symbolism informed the choice of materials for the eight soundtracks, particularly the musical and poetic citations in each of the four scenes. The first scene is based on the fifteenth century French tune, *L'homme armé*:

L'homme, l'homme, l'homme armé, l'homme armé
L'homme armé doibt on doubter, doibt on doubter.
On a fait partout crier
Que chascun se viengue armer
D'un haubregon de fer.

The man, the man, the arm-ed man, the arm-ed man
The arm-ed man is to be feared, is to be feared.
Everywhere it has been proclaimed
That everyone should arm himself,
With an iron coat of mail.

to which the Artist responds, referring to the Dancer on the video:

The man, the man, this arm-ed man
This arm-ed man is to be desired.
Everywhere I shall proclaim
That I alone desire this man
With an iron coat of mail.

These opposing texts set up the tension between the image of the male as a threat and as a desired other, whether interpreted as a lover, an artistic image or a part of one's psyche. Much of the love poetry of the Medieval and Renaissance period conflates love and armed conflict in a similar way. The example chosen, by Giovambattista Marino (1569–1625), is:

I sing, Love, of thy warrior fair, and tell
Of all the mortal miseries I knew,
How I was vanquished by a glance and fell
Snared by a curl, a grievous tale but true!
Two lovely eyes were weapons whence I lay
With troubled soul transpierced, and tears did flow

Instead of blood for many and many a day;
Thou, by whose daring prize and praise belong
To my victorious adversary, though
Dost kill the heart, givest life unto the song.

The conflict becomes more literal in the second scene, based on Monteverdi's *Combattimento*, of which the opening, prior to the battle, and the ending, with Clorinda's death and transfiguration, are used:

Tancredi che Clorinda un'uomo stima
vol ne l'armi provarla al paragone.

Ella mentre cadea, la voce afflitta movendo disse
le parole estreme,
parole, parole ch'a lei novo spirto adita.

Tancredi, who believed Clorinda to be a warrior,
Seeks forthwith to engage her in mortal combat.

She can no more oppose him, her voice will
scarce obey her,
Yet faintly she breathes her last words,
Her last words that yet a new spirit infuses.

The Artist, assuming a female persona, distorts the text:

Clorinda, who wished Tancredi to be her lover,
Seeks forthwith to engage him in mortal combat.

He also sings a setting of the beautiful Sonnet by Guido Cavalcanti (1255–1300) which concludes by mirroring the death scene on video with an apparent self-strangulation:

Love, who hath drawn me down through
devious ways,
Hath from your noble eyes so swiftly come!
'Tis he who hath hurled the dart, wherefrom
my pain,
First shot's resultant! And in flanked amaze
See how my affrighted soul recoileth from
That sinister side wherein the heart lies slain.

The third scene continues the theme of the tragic discovery, grief and its transcendence by referring to those themes as portrayed in Wagner's *Tristan und Isolde*, specifically the ending, starting with King Mark's remorseful:

Why, Isolde, why this to me?
When what I had not grasped before
Was finally made clear to me.

to which the Artist provides the variant:

Why, Tristan, why this to me?
When what I had desired before
Was finally denied to me.

The musical reference is a phrase from Isolde's famous *Liebestod*:

Höre ich nur diese Weise, die so wundervoll und
leise,
Wonne klagend, alles sagend, mild versöhnend
aus ihm tönend,
in mich dringet, auf sich schwinget, hold
erhallend um mich klinget?
Wie sie schwellen, mich umrauschen, soll ich
atmen, soll ich lauschen?

Do I alone hear this melody
Which, so wondrous and tender in its blissful
lament,
All-revealing, gently pardoning, rises above,
Blessedly echoing and ringing around me?

The Artist's poetic commentary on this text comes from the ending of Rilke's *First Duino Elegy* (as translated by Norbert Ruebsaat) which similarly mourns the loss of the 'god-like youth' and finds a comforting energy that moves beyond grief:

But the living all make the mistake of dividing
too sharply;
Angels (they say) often did not know if they
walked
among the living or the dead. The perpetual
torrent
... drowns them out in each.
... once when they mourned for Linos
tentative primal music pierced brittle despair;
only when the room felt the shock
of the almost god-like youth's sudden departure
forever
the emptiness started to vibrate with that motion
which now uplifts us and comforts us and
helps us?

At the beginning of the final scene, the Seer blindfolds himself in a gesture of symbolic blindness that leads to insight, and the Artist leaves the stage, apparently responding to a distant melody which he begins to hear for the first time. He enters the white light of the video projector where he removes his shirt and appears in silhouette until the next video starts. The Seer's musical reference is to the phrase in Stravinsky's *Oedipus Rex* where the king appears blinded:

Lux facta est! Now is all made clear!

The poetic response is the Latin text where Oedipus' subjects simultaneously bid him goodbye and confirm their love and pity for him:

Vale, vale Oedipus, miser Oedipus noster
Te amabam, te miseror
Miser Oedipus, oculos tuos deploro.

Farewell Oedipus, our poor Oedipus
I loved you, I pity you.
Wretched Oedipus, I lament the loss of your eyes.

The tape version includes the variant where 'Oedipus' is replaced by 'Sappho' and 'eyes' is replaced by 'voice', in reference to the female dancer who is entwined with her virtual image on the screen. The Artist then returns, clad in a magnificent marriage kimono depicting two white cranes, and sings the variant of the Oedipus text that signifies his acceptance of the 'other' within himself:

Welcome, Oedipus, I love you, I embrace you.
Blessed Oedipus, I welcome your new found sight.
Welcome Oedipus, my own dear Oedipus,
I love you, Oedipus, I embrace you in me.

The final image of the work is the Artist facing the video screen, his arms and kimono opened wide to cover it and expose the splendour of the garment. The Dancer returns to the platform where she stands behind the Seer who is seated in a meditative posture, and reaches upwards with the fringed scarf in a gesture of vertical unity.

4. CHOICE OF INSTRUMENTAL AND ENVIRONMENTAL SOURCES

All of the other sounds used in the work provide a contrast to the speech and sung material as accompanying environment. The musical instrument sounds, for instance, are all associated with non-European cultures, and hence provide a broader frame of cultural reference than that of the European archetypes which inform the four scenes. The environmental sounds are used only in the four interludes between the scenes, and were chosen, first of all, for their vivid, even hyper-realistic quality. That is, the listener is periodically brought back from the world of symbols and myths, all encased in the diffuse sound field created by the processing techniques, to a place that is more familiar and realistic. Structurally, these interludes also provide the opportunity for the dramatic interactions between the characters to unfold. Therefore the interludes and scenes act in a manner similar to the traditional *recitativo* and *aria* forms in opera. This comparison, however, is not merely between speech and song, but rather between realistic and imaginary spaces, between dynamic interaction and more static forms of individual emotional expression, or even between left and right hemisphere modes of analytical and wholistic thought.

The ambiences also provide a subtle level of symbolism, as in the nourishing image of the rain that accompanies the Seer's attempts to communicate to the Artist and help him, or in the thunder that expresses the pent-up tension of the death at the end of the second scene. The final interlude creates an image of suspended time through the endless buzz of cicadas on a sultry Mediterranean afternoon, with a church bell in the distance, presaging the ritual that is to follow in the final scene.

The other Pacific Rim musical instrument sounds are heard either alone or in fused, punctuating chords where they are digitally mixed with synchronous attacks, a technique first used in my tape solo *Sequence of Later Heaven* (1993). The choice of instrument is generally motivated by its symbolism. The opening, for instance, features the four elements of earth (marimba), air (ocarina), fire (metallic percussion mix), and water (rain). The life-giving breathy sound of the ocarina is used throughout to underscore the Seer's gift of images. The battle scene replaces the marimba with the drum (the South American *bombo*) to establish a militaristic mood. It is mixed with various metallic gongs to accompany the male text '*e guerra e morte*/war and death' which is cross-faded with the female text '*amore e vita*/love and life' mixed with a high-pitched Japanese *furin* bell.

The third scene is marked by a mixture of a plucked chord on the Chinese stringed instrument, the *guzheng*, combined with a tam-tam, in order to symbolise the sense of grief and hope that is being expressed. The final scene is introduced by a return of the deep marimba note of the opening chord combined with a Chinese gong to mark the decisive turning point of the white light and blindness image. The ritualistic aspect of the ending is strongly supported by a series of resonant gong strokes that provide the very slow tempo of the final song. Each stroke is resonated in a stereo digital delay line where the feedback level is gradually raised until it dominates the original sound. At that point, the gong attack is progressively removed until the resonance of the original and the processing seem indistinguishable. The last stroke occurs on the Artist's final phrase 'in me' and the Seer's meditative 'om'.

All eight tracks on tape are diffused through an eight-channel sound system by means of a specially designed digital controller using multiple DSP technology. The first advantage of this approach is that it allows the eight source tracks to be kept separate with an arbitrary speaker assignment (as opposed to going through the more usual stereo mix). This allows the various types of sounds to be distinguished more clearly without masking since they emanate from independent sound sources (i.e. separate loudspeakers). Even though the soundtracks are generally organised as four stereo pairs, each stereo track is uncorrelated with its pair, that is, the sound events, while similar left and right, are distinct and indepen-

dent. With the granular sounds, this is achieved with separate grain streams in each channel. With the resonated sounds, separate delay lines are applied to each channel. Finally, with the environmental sounds, the left and right channels are recorded separately, even when derived from the same source.

The second and more significant advantage of the computer-controlled diffusion is that it allows independent spatial trajectories to be placed on individual tracks. One such pattern that is impossible to achieve with a conventional analogue mixing console is simultaneous movement in opposite directions, such as circles in clockwise and counter-clockwise motion. Given the extensive use of binary symbolism in the piece, this type of spatial pattern has special significance. It is used at the beginning of the piece when the resonated counter-tenor pitch D splits into male and female versions of the same note which rotate in opposite directions, slowing down with each repetition and adding G pitches above and below plus the octave lower. Likewise, during the last scene, the resonated *Lux facta est* tones circle in opposite directions as the gongs step between speakers in a procession around the hall. At other points, female tones circle clockwise, male tones counter-clockwise, the ocarina notes sweep from front to back in a polyphonic pattern, and so on. Digital control at all levels of production and performance is required to completely integrate the system of symbolic patterns implicit in the material of this work.

5. CONCLUSIONS

The opening section of this paper posed the question of how to treat the relationship of a sound to its source, where I have interpreted 'source' as the complete context of the sound's origin. The acousmatic approach suggests that we should sever the sound–source connection to create a 'sound object' – an aural artifact detached from the real world, an 'object for perception'. By analysing the spectromorphology (Smalley 1986) of the sound object, we can create transformations that are 'abstracted' from the original sound and hence create a purely aural discourse (Emmerson 1986). Although works which follow this approach are extremely aurally attractive and often more engaging than their instrumentally based counterparts, the approach does not depart significantly from the European tradition that the work of art aims at the highest possible level of abstraction. The value of this tradition cannot be ignored or dismissed, but its continued viability must be questioned in the current socio-cultural context of dwindling audiences and increased corporate domination of culture.

The question that must be asked if we choose the alternate approach, that is, *not* to sever the sound–source relationship, is what language of discourse will emerge. The main precedents (e.g. programmatic music, sound effects, collage, functional music, etc.) are not inspiring. I have offered the twenty year history of the soundscape composition as suggestive of a more fruitful direction, but the examples created to date seem mainly to emphasise the listener's involvement in terms of environmental associations and memories, a type of participation that can certainly engage an audience more directly than can abstraction, but one which seems privatised in terms of a musical language.

The 'language' which I am seeking seems to be the language of timbre, which as John Shepherd (1987) has pointed out, 'speaks to the nexus of experience that ultimately constitutes us all as individuals. The texture, the grain, the tactile quality of sound brings the world into us and reminds us of the social relatedness of humanity'. In other words, an emphasis on timbre involves the listener in the real world of gender, environment and cultural symbols. Its multidimensional inner complexity mirrors the complexity of the external world, much more so than does the single dimension of pitch. Some would argue that timbre cannot be the basis of a musical language since it lacks syntax. However, spoken language and environmental sound are both systems of communication which depend heavily on the perception of timbral structure. Therefore, what seems to be required is a redefinition of what constitutes syntax within a timbrally based system of musical communication and what makes it a language.

Although *Powers of Two* relies heavily on language, both spoken and sung, the nonlinear treatment of the text, switching as it does between stories and names, allows the form of the sounds used to communicate as much as their inherent meaning, in a manner analogous to the instrumental and environmental sounds in the piece. Sounds that have a strong aural character and a well-defined source context become symbolic of that context and the meanings derived from it (e.g. a churchbell). The way the sound is further shaped in a composition allows another layer of implication to be added to the symbolism, that is, it allows the sound to enter into a symbolic discourse. Relationships between symbols are created and the tension or energy that results propels the resulting discourse. Perhaps not surprisingly, what we need to rediscover is the power of myths which operate entirely as symbolic discourse.

On one level, we can understand the myth as a story because we recognise certain aspects of it as realistic. However, we always know that the characters and other elements of the story are symbols, the embodiment of ideas and truths which otherwise would not have a corporeal form. Most of all, we sense that the myth allows us to experience a deeper

truth in all of its dimensions, instead of trying to persuade us with a purely rational argument. It is a powerful technology for communication based on images and symbols that has continued to speak to people over the centuries. Our current technology provides us with a remarkable opportunity to manipulate virtual sounds and images that address the world of the imagination directly, and yet, the predominant impression of technology's current artistic uses is that content is lacking. Post-modernist thought tells us that all truths are socially constructed and leaves us adrift in a sea of relativism. Post-modernist art deconstructs the past and spray paints over all values, whether moral or aesthetic. The only myth that is created is that there are no myths.

Powers of Two is a personal attempt to create a contemporary myth from the wisdom of the past and give it a dramatic, human form. It uses contemporary technology to create the virtual image of the 'other' as it exists in our minds, and to evoke the various emotions we experience when we seek to integrate our fragmented selves. Thus, at one level, all of the characters in the work represent parts of the individual which seek integration. At other levels, it portrays the union of the male and female archetypes within the self (the *animus* and *anima*), the sexual union of the self and other, and the spiritual attainment of oneness. It also comments on the role of art in transmitting images, filtering them through the artist's desires and ego; hence the artist has no monopoly on the truth, only the gift to participate more elegantly in its expression. The ending offers a vision that such attainments may still be possible.

I have tried to show that electroacoustic music theatre has the capability of addressing the large issues of human values within a contemporary language that can deal fluidly with images and symbols. The irony is that, while the capability is there, it is largely not recognised or supported. This particular piece, though generously commissioned by the Banff Centre with the assistance of the Canada Council, had to be created and produced within the mandate of a concert work. The Council's programme for contemporary music theatre was cancelled a few years ago. Even when the programme was in operation, the companies that were supported tended to work within the limits of a traditional chamber opera format with a small instrumental force, perhaps because of their lack of familiarity with technological options. Although it was valuable to give composers some experience in working in this genre, and it made some audience members aware that more or less palatable contemporary work existed, the results did not usually create any new definition of the dramatic musical form with contemporary means. Despite the economies which the use of electroacoustic music could bring, production budgets for theatrical pieces are much higher than for concert presentations. Moreover, in North America, the mass media, including those in the public sector, inform the public about cultural life in approximately direct proportion to the profits that are to be made from it. Therefore, with minimal public and government support, and little interest on the part of professional companies, it appears unlikely that much progress will be made in this direction.

Finally, then, it is up to electroacoustic composers to create the musical language and find the means to communicate with it. I suspect it will mean rejecting both the aesthetic of nonsense and meaninglessness adopted by the avant-garde earlier in the century, and the aesthetic of nihilism offered by the post-modernists today. It will also certainly involve redirecting the single-minded pursuit of abstraction promoted by the academy. It could even involve a major paradigm shift in the direction towards complexity (Truax 1992a), not merely the internal complexity favoured by the abstractionists, but rather a reintegration of that complexity with sources in real world contexts. The language of timbre, the main sonic link between speech, musical instruments and the soundscape, will probably play a key role. One hopes that technology will also help to create new possibilities to access the public as well as new techniques for artistic expression. But when the opportunities do present themselves for communication, will artists have something worthwhile to say? Re-examining the technology of myths might not be a bad place for them to start.

REFERENCES

Emmerson, S. 1986. The relation of language to materials. In S. Emmerson (ed.) *The Language of Electroacoustic Music*. London: Macmillan.

Schafer, R. M. 1969. *The New Soundscape*. Vienna: Universal Edition.

Shepherd, J. 1987. Music and male hegemony. In R. Leppert and S. McClary (eds.) *Music and Society*, pp. 151–72. Cambridge: Cambridge University Press.

Smalley, D. 1986. Spectro-morphology and structuring processes. In S. Emmerson (ed.) *The Language of Electroacoustic Music*. London: Macmillan.

Smalley, D. 1992. The listening imagination: listening in the electroacoustic era. In J. Paynter, T. Howell, R. Orton and P. Seymour (eds.) *Companion to Contemporary Musical Thought*. London: Routledge.

Truax, B. 1984. *Acoustic Communication*. Norwood, NJ: Ablex Publishing Corporation.

Truax, B. 1988. Real-time granular synthesis with a digital signal processor. *Computer Music Journal* **12**(2): 14–26.

Truax, B. 1990. Composing with real-time granular sound. *Perspectives of New Music* **28**(2): 120–34.

Truax, B. 1992a. Musical creativity and complexity at the threshold of the 21st century. *Interface* **21**(1): 29–42.

Truax, B. 1992b. Composing with time-shifted environmental sound. *Leonardo Music Journal* **2**(1): 37–40.
Truax, B. 1992c. Electroacoustic music and the soundscape: the inner and outer world. In J. Paynter, T. Howell, R. Orton and P. Seymour (eds.) *Companion to Contemporary Musical Thought*. London: Routledge.
Truax, B. 1994a. The inner and outer complexity of music. *Perspectives of New Music* **32**(1): 176–93.
Truax, B. 1994b. Discovering inner complexity: time-shifting and transposition with a real-time granulation technique. *Computer Music Journal* **18**(2): 38–48 (sound sheet examples in **18**(1)).
Truax, B. 1996. Soundscape, acoustic communication and environmental sound composition. *Contemporary Music Review* **15**(1): 49–65.
Wishart, T. 1985. *On Sonic Art*. York: Imagineering Press.
Wishart, T. 1986. Sound symbols and landscapes. In S. Emmerson (ed.) *The Language of Electroacoustic Music*. London: Macmillan.

DISCOGRAPHY

Song of Songs. Cambridge Street Records, CSR-CD 9401, 4346 Cambridge Street, Burnaby, British Columbia, Canada V5C 1H4 (includes *Sequence of Later Heaven*).
Powers of Two. Cambridge Street Records, CSR-CD 9601, 4346 Cambridge Street, Burnaby, British Columbia, Canada V5C 1H4 (forthcoming).