

PULSE FIELD

SoundScape V

SURREALIST

ANTIPHONIES

**Program by: Robert S. Thompson, Ph.D.
December 2002**

PULSE FIELD

SoundScape V

Disc I

Natasha Barrett (United Kingdom / Norway)

Natasha Barrett began working seriously with electroacoustic composition during a master's degree in analysis and electroacoustic composition, studying under Jonty Harrison. This study gave her the opportunity to work with BEAST (Birmingham Electroacoustic Sound Theatre), and has greatly influenced her current work. In 1998 she was awarded a doctoral degree in composition, supervised by Denis Smalley. Both degrees were funded by the Humanities section of the British Academy. In the same year, a grant from the research council of Norway enabled her to work as a resident composer at NoTAM, Oslo (Norwegian network for Technology, Acoustics and Music). Afterwards, she worked for one year as a senior lecturer at the music conservatory in Tromsø, Norway. She is now a freelance composer and teacher, based in Oslo.

Her compositional output consists of works for instruments and live electronics, sound installations, dance, theatre, and animation projects, but all activity is rooted in her work with acousmatic tape composition, which features most strongly amongst her creations.

Her work has received many awards, including Prix Ars Electronica (Linz, Austria 1998), Noroit-Leonce Petitot (Arras, France 1998 & 2002), first prize in the Trivium section of the Bourges International Electroacoustic Music Awards (France 1998, 2001, and a mention in the same competition in 1995), Concours Scime, (France 2000), International Electroacoustic Creation Competition of Ciberart (Italy 2000), Concours Luigi Russolo (Italy 1995 and 1998), and selection in the IREM 2002. She has received commissions from institutions and performers in throughout the world, and her work is available on numerous CD labels, including empreintes DIGITALes, Cultures électroniques/Mnemosyne Musique Media, CDCM/Centaur, and two privately produced solo CD productions.

1) ...the fetters of a dream...

14:45 2002

The laws of physics describing the activity of molecules within an enclosure explain how energy input will result in a faster and more violent activity, until the enclosure breaks under the increased pressure. Both the dramatic and sonic content of "...the fetters of a dream..." find place within these laws, yet the idea of the enclosure breaking apart is paradoxically flawed: beyond one enclosure there is a second and a third.

"...the fetters of a dream..." is the second of two compositions underlying a one hour music-theatre work called "Agora". The dramatic source is influenced by the enclosure of the Agora, but in "...the fetters of a dream..." a new direction is explored, and the resulting composition is fundamentally different.

Three types of vocal material are used: extracts from The Poetic Edda in original Old Norse spoken by Magnus Rindhal, environmental recordings from Smithfield market in London's East End; and the female voice of soprano Kristin Norderval. The title is borrowed from a line in Wordsworth's poem Laodamia.

"...the fetters of a dream..." was commissioned by Norwegian Radio, and was created in the composer's studio. The work was selected by the International Rostrum for Electroacoustic Music

2002 (a collaboration between international radio broadcasters) in both the main category and in the category for young composers.

2) Viva La Selva!

17:37 2002

(Long live the forest)

In four continuous sections:

1. Morning introduction (claiming territory)
2. Midday heat (mad insects, mellow birds and lazy day dreams)
3. Dancing at night (a frenzied bizarre)
4. Dawn and rain (long live the forest!)

In the New Year of 1999 a number of items of recording apparatus, a colleague, and myself travelled to a Central American rain forest. The aim of this adventure was to record animal vocalisations over a continuous 24-hour period with a microphone array. The data we recorded was used for bioacoustic research and music composition.

In "Viva la Selva", source sounds, the locations of animal vocalisations, the vocal and spatial relationships between different animal species, the change in dynamics over the 24 hour period, and my experience venturing through a dense jungle, daytime and night-time, all contribute to the musical and narrative structure.

Most of the source sounds are insect, bird, frog and monkey calls. In the jungle, some of these animals can be seen, while other bizarre sounds do not reveal their causes. After some days in the forest, the spectral distribution of the sound environment revealed interesting inter-species sound relationships, and this idea is manifest in the composition where many animal calls have been temporally and spatially substituted by human vocal articulations.

"Viva la Selva" stars mantled howler monkeys, white capped manakin birds, poison arrow frogs, cikadas, tink frogs, oropendola birds, tinamou birds, a humming bird, mosquitoes, a single engine aeroplane, and numerous other forest and forest-edge animals.

"Viva la Selva" was created in the electroacoustic studio of the music conservatory in Tromsø, Norway. The work was commissioned by NICEM (Norwegian section of the ICEM), with support from the Norwegian composers' fund. The work was selected for the finals of both Concours Scime, France 2000, and International Electroacoustic Creation Competition of Ciber@rt, Italy, 2000.

Sound, Space, Scene, Structure

Natasha Barrett

Electroacoustic and computer music can be more closely connected with emotion, to a larger degree use material from nature and human relationships, and appeal more directly to our perception and memories than does performed, instrumental music. My personal view of musical quality combines emotional connection and rational response. Therefore two fundamental philosophies are important in my composition: that a sound detached from its visual causation, or what we can call an 'acousmatic' sound, can evoke a world of personal connections, and that a rigorously composed, multi-layered musical structure is available for the listener to rationally explore in combination with their subconscious emotional response. These aspects of musical creation and appreciation have nothing to do with visuality, and may even appear to render unimportant the use of performed instruments. When indulging in lengthy acousmatic composition sessions the legitimacy of this idea is often evident. Nevertheless I also compose music involving acoustic instruments, work with sound installations where some visual element is integrated into the process, and explore aspects of music combined with theatre, architecture and performance. But all activity is rooted in the acousmatic concept, and acousmatic works feature most strongly in my output. The following presents an overview of some acousmatic compositional strategies that connect to emotion, rationality, nature, perception and memory. Some of the text is summarised from larger bodies of work associated with specific compositions or sound examples, which readers can investigate further if they wish.

An introduction to sound

In a reductionist approach to electroacoustic music, two main categories of material and structure can be considered: the intrinsic and the extrinsic. This holds true on all temporal scales, and when considering both the isolated sound and the relationship between materials. The 'intrinsic' is the spectrum, its morphology, and the structural organisation concerning the spectral evolution solely as series of frequencies and articulations, however complex. The 'extrinsic' is the sound's capacity to imply, to refer, or to associate with something other than that empirically present in the spectrum. Our memory plays with the 'extrinsic', bringing forth associations we have with the sound. Extrinsic and intrinsic properties are not mutually exclusive. They interact as our perception finds or looses connections through the act of listening. From an extrinsic standpoint, when neither source nor causality are clearly recognisable we find ways to place the sound into the context of our knowledge of the world. Smalley (1997) refers to this as source-bonding.

In considering sound identity, extrinsic links to sounding objects, to symbols or to gestural analogies can be investigated. Likewise, the listener can find extrinsic links to the spatial disposition of the object, the space in which the object is sounding, or the space in which we think the object should sound. These connections are derived from our

perception of the sounding identity. The intrinsic aspects of the sound are clearly important in forming these extrinsic links.

Spatio-musical composition strategies

Spatial elements in acousmatic music are inherent to the art form: in composition and in the projection of the music to the listener. For 'space' to be more than a setting within which the main active elements in the structure unfold, the spatial variation needs to cover a range of perceptually different states. There are a number of spatial composition strategies available to the acousmatic composer in light of current technology and sound reproduction situations.

Without the sound's visual source to serve as a spatial reference point, the composer is free to manipulate the disposition of a sound-object within a space, the space within which the object is sounding, and the relationships between objects, between spaces, and between object/space pairs. Five main approaches to space and how the composer can work with these ideas can be considered:

1. The illusion of a space or a spatial location of an object.

In the spatial illusion the perceived space appears real, but we are listening to an illusion in stereo or multi-channel space produced through the phantom images from two or more loudspeakers.

2. The allusion to a space or a spatial location of an object.

When space is implied without a direct illusion, or without a direct connection to the interrelated acoustic laws of objects sounding in spaces, we can begin to discuss the spatial allusion. Under such situations the 'listening imagination' is important: composers need to make assumptions concerning aural interpretation, and listeners have a more active role in the experience. Because the spatial allusion is open to interpretation more than the spatial illusion (due to its images being less precise), it is maybe here that the 'music' begins to emerge. The transformation from illusion to allusion is therefore an important spatial developmental process.

3. The simulation of the three-dimensional sound field.

Manipulation of the virtual three-dimensional spatial continuum is becoming more relevant to the composer as new technologies emerge. The required spatial resolution and spatial accuracy in the virtual three-dimensional sound field will partly depend on the application. When producing documentary three-dimensional sound recordings (which may also be a part of a composed work) the sound field needs to mimic reality such that departure from reality is below our perceptual threshold (such an audio reproduction system was described as reality-mimicking by Malham 2001). When working with non-documentary sound fields in a composition, the requirements change. From a cognitive rather than physiological or psychoacoustical point of view we can assess spatial

information in the virtual field in two ways: (a) by associating sound identity with the discrete location we believe the sound should have in relation to reality, (b) by comparing spatially different materials and drawing on their spatial relationships. The relationships between spatial objects rather than their discrete spatial position then gain in importance, especially when direct sound identity may be of less importance in the music. Therefore the composer can 'get away with' less accurate discrete spatial locations as long as the object relationships are maintained. Images can be rotated, and sizes and distances distorted without significant disturbance to the musical landscape, as long as the relationships remain stable. Use of ambisonics techniques is currently the most effective application of the three-dimensional spatial continuum in the listening space. (Ambisonics encoding attempts to preserve spatial information, and this information is decoded over a chosen loudspeaker array. For a technical explanation of ambisonics see Malham and Myatt 1995.)

4. Spatial possibilities contingent upon temporal development.

Sound transformation and mixing techniques allow the composer to move freely through the spatial illusion and allusion. When considering temporal development, the listeners' memory is an important consideration. In contemporary instrumental music, memory for pitch, rhythm, and to some extent timbral motifs is trained through the course of listening to the specific work. New motifs are presented and developed for each piece of music, and the listener needs to remember this development to appreciate the structure of the work. In contrast, the listener's spatial perceptions can be linked to an experience of the world outside the context of the music: the perception of spatial information exists through our connecting it to real-world experience, drawing on the contents of long term memory, whether through illusion or allusion cues. Although clearest memories may be retrieved when hearing recognisable sound-objects and direct spatial relationships, spatial memories may also be evoked through less direct sound identities and motion characteristics. However, when the composer transforms or collages spatial information in the composition, the temporal transformation may easily depart from any real-world temporal experience. In this case the spatial information presented over time can be unique to the context of that particular work, and therefore requires listeners to train their memory through the act of listening. Thus the composer can choose whether to draw on existing long term memories, or challenge the listener with unique information. In other words the composer can combine self-referential and outer-referential developments.

5. The role of the listeners' space in the transmission of spatial information.

Consideration of the composed space cannot end in the studio. The space in which the music is heard and the way it is performed have important consequences for the spatial aspects in the music. A consideration of the position of each member of the audience in relation to the spatial information is also important. In sound diffusion, the performer normally attempts to provide a reasonable spatial picture to the complete audience, accepting that each individual will receive a different view. In the three-dimensional sound field the audience's position may change.

For a detailed account of spatial aspects in musical structure see Barrett (2002).

The connection between sound, musical structure, and natural phenomena.

As for a great number of composers, aspects of the natural world are important in my work. Often, composers use techniques consisting of traditional acousmatic methods, for example recording environmental and other acoustic sound sources, transforming and mixing these materials with various degrees of surrogacy to evoke a musical or extramusical concept based on aural judgment. In contrast to this tradition, numerical data can prove useful for clearly and accurately articulating natural phenomena. Nature's formations are created by, and are part of, complex processes. In many cases, the understanding of these processes is aided by numerical modelling techniques or by accurate observational methods. If numerical data from either modelling or observation are to be used in a music composition, there are several questions that need to be asked: which aspects of the subject do I wish to capture in the music? Which aspects of the micro- and macrostructure should be controlled, and what aspects of the data are musically most appropriate? Do I need to rescale data sets such that the listener can perceive a musical 'mapping'? Two contrasting compositions deal directly with these questions: the acousmatic work *Viva la Selva* and the installation *Displaced:Replaced II*. In *Viva la Selva* recordings of animal vocalisations in a neo-tropical wet forest were made over a continuous 24-hour period with a microphone array. The data were analysed to reveal the spectral, temporal and spatial distribution of animal vocalisations. Source sounds, the locations of animal vocalisations, the vocal and spatial relationships between different animal species, the change in dynamics over the 24 hour period, and my experience venturing through a dense jungle, daytime and night-time, all contribute to the musical and narrative structure. A detailed account of this can be found in Barrett (2000:20).

Displaced:Replaced II is an installation designed to capture real-time meteorological forces and the effect of these forces on the natural environment. A three-dimensional sound space is controlled by real-time weather data using rule-based mapping procedures. Real-time graphics, controlled in parallel with the sound, are produced by physical modelling of weather conditions, including a realistic wind model based on the Navier-Stokes equations. The result is a mimetic abstraction of the meteorological source, projected through sound and vision within the space. By applying a rule-based rather than direct mapping from data to sound, the composer can on the one hand control the installation through composing the sound material and the rules that translate the data, while on the other hand the weather determines the realised result. Likewise is the case with the visualisation.

Theatre, performance, interaction.

With recent sound-spatialisation techniques it is possible to create a three-dimensional field where sounds act as if they are real physical bodies. Under these conditions the impossible and the surreal become real. In conjunction with visual materials, a new space

can be created where both the sound and physical constructions are explored in parallel: each reflecting on the other in time and space.

Under this framework grew the idea of the *Agora* project. *Agora* is a theatre work involving electroacoustic music, a soprano, a sound-making theatre-set and the structural use of space (physical, sonic and aural). There is one performer, but no 'acting out' of a strict theatrical structure. The spatial disposition of sound via loudspeakers, physical resonating objects as carriers of sound, and the motion of the solo performer through the space fuse with different aspects of the performer's gradually revealed personas.

An important aspect of *Agora* is a large construction made from long metal tubes and plastic membranes. This construction fills the performance space, above and around the audience. The audience sits in the centre surrounded by the drama and the sound-world. Outside the hours of the performance the audience can pass freely through the space and experience a different temporal and spatial experience than that possible during the performance. The theatre-set / installation is designed for the following purposes: to guide the physical motion of the performer, to visually define a multi-layered space and to act as a large computer controlled interactive acoustic instrument. It addresses the boundaries between performance, architecture, sound, and audience space.

The spatial structure of both the music and the theatre set is based on a common model. This model is the time evolving 'trace' left by a computer simulation where people with different personalities are placed within a virtual space. These virtual people attempt to reach defined goals without colliding with each other or with fixed objects. The result is a spatial patterning that reminds of something subconsciously perceived everyday. The model is then adapted for the current real space. The simulation uses certain collision detection and avoidance algorithms incorporating 'personality' rules for each virtual agent.

The sound-making theatre set can also be taken out of the theatrical context and placed in a public space where it becomes a sound installation called *Boundary Conditions*. *Boundary Conditions* consists of four elements: the main physical construction, a three-dimensional sound field simulation using ambisonics, live electronics which turn some surfaces and trajectories into vibrating physical instruments, and the possibility for the public to interact, where the numbers of people in a specific location correlate with the intensity of the live electronics. *Boundary Conditions* was installed in the Oslo Central Station, May 2002.

Selected listening

- Barrett, N. 2002. Prince Prospero's Party. Stereo version in press. Ambisonics version available from the composer.
- Barrett, N. 2000. The Utility of Space. Stereo version released on *Isostasis*. IMED 0262. Ambisonics version available from the composer.
- Barrett, N. 2000. Viva la Selva! Released on *Isostasis*. IMED 0262.

References

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- Barrett, N. 2002. Spatio-musical composition strategies. *Organised Sound*. In press.
- Malham, D., Myatt, A. 1995. Three-dimensional Sound Spatialisation using Ambisonic Techniques. *Computer Music Journal* 19(4): 58-70
- Malham, D. 2001. Toward Reality Equivalence in Spatial Sound Diffusion. *Computer Music Journal* 25(4): 31-38
- Smalley, D. 1997. *Organised Sound* 2(2): 107-126

George Brunner (United States)

“Striking, sonorous music” says John Rockwell of The New York Times. George Brunner has created and performed electro-acoustic and computer music with John Cage, James Tenney, Morton Subotnick, Pauline Oliveros, Joan LaBarbara, Charles Dodge, Iannis Xenakis, Vinko Globakar and others at venues such as Merkin Hall, DIA Art Foundation, Symphony Space, Alternative Museum, Experimental Intermedia, and California Institute of the Arts. His music has been performed throughout the United States, in Europe, Asia, and South America. He has provided sound design and underscoring for *One Dream Theater* in Manhattan, created original scores for Hong Kong video artist Derek W.K. Chang, and composed *Crescent Ridge* for *The Brooklyn Dance Theater*. He has received commissions from the contemporary music *Relache Ensemble* from Philadelphia, the *PIAP Ensemble* for percussion from São Paulo, Brazil, American oboist Libby Van Cleve, and American double bassists Nancy Merriam and Robert Black. *Ear Shot*, his structured improvisational work for 2 – 8 performers, won first place in a DNC International Competition for Notation and was displayed at the Wooster Gallery in SOHO, New York and at galleries in Columbus, Ohio and San Francisco, California. *She Stood Weeping*, a piece for modified Bb clarinet/ live dsp / pre-recorded clarinets (bass, contrabass, contralto, Bb), based on a text by Pope Innocent III, featured American clarinetist Todd Brunell in a special performance at the festival to celebrate the 25th anniversary of The Society for Electro-Acoustic Music in the United States (SEAMUS).

Brunner has served as composer-in-residence at *EMS* (electro-acoustic music studios) in Stockholm, Sweden and *Kungliga Musikhögskolan i Stockholm* (Royal College of Music in Stockholm), Sweden. A recent recipient of a research grant from the *Svenska Institutet* of Sweden, he is at present writing a book on Text Sound Composition and is considered an authority on the subject.

Brunner currently serves as Director of Music Technology for the Brooklyn College Conservatory of Music and is the founder of the *Brooklyn College Electroacoustic Music Ensemble*, which under his direction produces an annual CD. He also founded and coordinates the biannual *International Festival of Electro-Acoustic Music* at Brooklyn College, New York City.

3) Art in Heaven

6:18 1999

Art in Heaven is a text sound composition. Several texts are used in both Latin and English, sacred and secular. One text “Pater noster” is both spoken and sung. The sung melody is taken from the 11th Century Solemn Mass of Easter Day (anon.). Other texts were taken from parts of Latin texts that were translated into English. The composer wrote the secular English text. Bell sounds were sampled from various churches and other sources and the organs were sampled or synthesized.

Bruce MacIntyre, Jerald Miller, Safiay Ama Samms, Joshua Samms and George Brunner, voices.

4) Anthem

7:12 2001

Anthem is a text sound composition based upon the words to the national anthem of the United States (Star Spangled Banner). New words were generated using convolution, mutation and subtractive synthesis techniques from the pre-recorded spoken text. The original text, by Francis Scott Key, is in four verses; however, for this work only certain phrases were used –

*Say can you see
Dawn's early light
Twilight's last gleaming
Perilous fight
Ramparts we watch'd
Gallantly streaming
Rockets red glare
Bombs bursting in air
Proof thro' the night
Flag was still there
Land of the free
Home of the brave*

This composition was composed during the Autumn of 2000 at the Center for Computer Music at Brooklyn College and remixed at EMS in Stockholm, June 2001.

5) Women in Black

21:43 1995-98

This is a suite of five pieces each based upon the verse of the poem "The Call" by Jules Supervielle.

The sound sources used are: spoken text: Catriona O'leary, soprano; pianos: (3 acoustic and one synthetic); violins: (4 sampled); electronic sound.

The semantic component of the poem is not the focus of the work but rather the sound of the words.

The suite was composed in Stockholm and New York between 1995 and 1998.

PULSE FIELD

SoundScape V

Disc II

Roger Reynolds (United States)

Roger Reynolds was educated in music and science at the University of Michigan. His compositions incorporate elements of theater, digital signal processing, dance, video, and real-time computer spatialization, in a signature multidimensionality of engagement. The central thread woven through Reynolds' uniquely varied career entwines language with the spatial aspects of music. This center first emerged in his notorious music-theater work, *The Emperor of Ice Cream* (1961-62; 8 singers, 3 instrumentalists; text: Wallace Stevens), and is carried forward in the VOICESPACE series (quadrasonic tape compositions on texts by Coleridge, Beckett, Borges and others), *Odyssey* (an unstaged opera for 2 singers, 2 recitants, large ensemble, multichannel computer sound; bilingual text: Beckett), and JUSTICE (1999; soprano, actress, percussionist, computer sound and real-time spatialization, with staging; text: Aeschylus).

In addition to his composing, Reynolds' writing, lecturing, organization of musical events and teaching have prompted numerous residencies at international festivals. He was a co-director of the New York Philharmonic's Horizons '84, has been a frequent participant in the Warsaw Autumn festivals, and was commissioned by Toru Takemitsu to create a program for the Suntory Hall International Series. Reynolds' regular masterclass activity in American universities also extends outward: to the Sibelius Academy in Helsinki, IRCAM in Paris, to Latin America and Asia, to Thessaloniki. His extensive orchestral catalog includes commissions from the Philadelphia, Los Angeles and BBC Orchestras.

In 1988, perplexed by a John Ashbery poem, Reynolds responded with *Whispers Out of Time*, a string orchestra work which earned him the prestigious Pulitzer Prize. Critic Kyle Gann has noted that he was the first experimentalist to be so honored since Charles Ives. Reynolds' writing, beginning with the influential book, *Mind Models* (1975), has appeared widely in Asian, American and European journals, while his music, recorded on Auvidis / Montaigne, Mode, New World, and Neuma, among others, is published exclusively by C.F. Peters Corporation, New York.

In 1998, Mode Records released WATERSHED, the first DVD in Dolby Digital 5.1 to feature music composed expressly for a multichannel medium. "As in all art making, there is a kind of 'alchemy' going on [producing] a richly nuanced and authentic result," wrote Richard Zvonar in *Surround Professional*. In the same year, The Library of Congress established the Roger Reynolds Special Collection. Writing in *The New Yorker*, Andrew Porter called him "at once an explorer and a visionary composer, whose works can lead listeners to follow him into new regions of emotion and meaning."

1) Red Act Arias Suite

18:02 1997

The Red Act Project arose out of a text that Reynolds assembled from the works of Aeschylus and Euripides. *The Red Act* text portrays the mythic conflict between Agamemnon (subject of pride and of the state) and Clytemnestra (ruled by natural imperatives and personal loyalty), yet it is strikingly of *our* time. There are six principals: Clytemnestra, Agamemnon, Iphigenia (the compliant victim who rationalizes her fate), Cassandra (the defiant visionary), Menelaus, and Hecuba. This dark but intensely lyrical drama has imbedded within it several complementarities: *individual needs* as contrasted with *collective values*, and, more fundamentally, the *singular* in relation to the *multiple*.

The Project will include a family of responses to the three-part text, some dramatic, others reflective, some requiring massive forces, others that are soloistic. All carry forward in their ways the lyrical sweep of *The Red Act* as a tale and respond, as well, to its uniquely resonant language. The long-term goal is to draw upon the accumulating group of Project compositions in shaping an evening-long theatrical experience.

* *special 5.1 Surround Sound Version by Robert Scott Thompson*

The text:

waves
death

breath-----ks

heart

my hope is gone
flames
heart

my hope is gone now ever again to unwind some crucial good
from the flames about my heart. . .

my hope is gone

_____ . _____

flames

blossom
(longing . . . longing . . .)
longing
(longing . . . longing . . .)
breaks
at night
longing

_____ . _____

(flames
death)

blossom
at night

The Artists: The BBC Singers, Members of the BBC Orchestra

The Premiere: The Royal Albert Hall, London, 4 August, 1997, Leonard Slatkin conducting

The spatialization system: TRAnSiT , principal musical and technical assistance: Tim Labor

2) Versions-Stages

21:50 1991

Versions/Stages I-IV (1986-91)

for quadraphonic sound

** special 5.1 Surround Sound Version by Robert Scott Thompson*

A particularly attractive aspect of making music with the help of computers is that, if one's imagination suggests a question about how certain sounds behave over time and under certain conditions, one can explore the suggestion not only speculatively (within the imagination) but as actual sonic experience.

For example: A cathedral may have numerous stained-glass windows, windows that are in fixed positions and allow light and also color to come in; it depends on the time of day, the season of the year, and so on. The placement of such windows is a structure of opportunity for visual experience.

In my collection of five quadraphonic computer pieces, *Versions/Stages*, I devised a structure of opportunity for sound materials. Within a 5-minute time span, there is a pattern of metaphoric "windows" through which sounds can pass. Each of these hundreds of "windows" occurs at a particular moment in time, has a certain duration and position in space. Through this formal structure of opportunity, five one-minute sound sources are passed: music for cello, a Japanese actress portraying Dionysus, the sound of a delicate waterfall, a responsorial Chant, and the impact of powerful waves along the California coast of the Pacific. (Their order in this I-IV presentation is: cello, waterfall, Dionysus, ocean.)

Using algorithms I invented (SPLITZ and SPIRLZ), an overall computer paradigm specifies each detail of a possible 5-minute event. This form is then "illuminated" by the above-mentioned sound materials. It repeats five times, exactly. The effect is not unrelated to Monet's series paintings, for example, of the façade of the Rouen Cathedral under differing conditions of light. A set of four or five is presented in concert as a whole.

Versions/Stages was composed during 1986-91, at the University of California, San Diego's Center for Music Experiment, with the assistance of John Stevens.

— Roger Reynolds

The Edge of Imagination

Roger Reynolds

Professor of Music University of California, San Diego

During the 1980s, a number of leading institutions committed to the education of musicians began to consider the growing importance of technology. The building of a substantial program in this area, however, is a complex and expensive undertaking. As a result, consultation through small and carefully planned conferences is increasingly common. These remarks are adapted from a talk that I gave at the University of Michigan in the Spring of 1987. They address some who may be well-advanced in their careers as artists and find themselves considering, however tentatively, the possible importance of new and powerful tools, and they might also find application in the consideration and design of educational programs.

It had been my assumption - before first venturing into large time-sharing computer environments - that the rigors of creative work in music were sufficient to fully occupy the mind and emotions of a composer. Learning to understand and manipulate traditional musical materials is already a formidable task. Learning to think like a musical architect, however - to conceive fresh musical materials, to distribute them in time, to foresee the effects of this or that accumulation, of this offering, of that withholding - is something else again. There are a host of other factors, not the least of which is the management of one's emotional life. The composer must cultivate pockets of deviance, of personal and professional disobedience. Composition is, above all, an *individual* matter, and it would not do for an artist to seek a common perspective. There need to be some surprises, some areas of artifice, some extraordinary behaviors. As I have said, all this appeared to me a sufficiently intricate terrain; the additional considerations entailed in entering a time-sharing computer environment seemed alien, imposing, and probably unnecessary.

What follows is a brief perspective on what occurred when one individual already deeply committed to his profession faced the prospect of dealing substantively with another promising but remote area of knowledge. There needs to be, of course, a powerful incentive to inspire an actual, thoroughgoing re-education. Less formidable and more common is a situation where someone already expert in his field needs to acquire just enough perspective on another area of learning to achieve some previously unrealized aims. This was my case.. A variety of questions underlies the consideration of new technological prospects: What are the practical goals that an individual might entertain? What are the responsibilities of serious educational institutions? Should our discipline be to a degree redefined, even reconceived in the light of new opportunities?

My father was an architect. I remember vividly the image of him bent over his drawing board, the localized pool of light, his total immersion in transcribing his foresight onto vellum. I noticed (but was not then absorbed into) the uncommon world of necessary anticipation that was involved in his renderings. There were the elevations and site drawings that conjured up for the untrained mind what would eventually result from the building process he was detailing. There were sheets and sheets of line drawings that schematically laid out, from beginning to end (and the order clearly mattered), *exactly* how the builder was to proceed in order to insure strength, durability, utility, cost effectiveness, and, of course, aesthetic quality.

Perhaps it was this inculcation of wariness that has left me always uncomfortable at some level with the "real time" dimensions of music-making-its perilous-ness, its reliance on etched-in reflex and habit. But I have had some experience with that, too. As a teenager, my passion was the piano. A relatively late start in musical studies meant that, while practice paid its dividends, the sublime *thoughtlessness of performance technique* was not to be mine. My most rewarding experiences as a performer left me with the feeling that it was the music itself, and not I, that exercised control. Optimally, I avoided impeding the affective interaction between on the one hand musical content and succession and on the other my own capacities and predilections. I was literally *in thrall to music*, excited by but not entirely comfortable with this circumstance. As the time for defining objectives approached, I opted to enter a program first offered at the University of Michigan in the 1950's, a curriculum in engineering physics. As I look back now, it was plausible: materials and imagination, the practicalities of application along with the beauties of unfettered theory.

My engagement with composition did not begin until I .was twenty-five, and it happened under the ideal influence of Ross Lee Finney's uncanny combination of learned authority and innate spontaneity. One certainly needed knowledge, I thought he was saying, but it only took on value when manifested through creative action. The likelihood of admirable action (the making of a composition, for example) was improved by practice, but, it seemed to me, it was also never fully under one's control. The situation was reminiscent of my experiences with performance - distinctly non-objective, hence mysterious matters such as "musicality" and "intuition" were invoked when practical perspectives did not suffice. It was necessary to be "professional," but *competence* alone would not suffice. Leaving the university, I determined to put aside everything that I was able to recognize as peripheral, and to devote myself to the composition of music that would expand my awareness of materials and formal approaches. I remained abroad for seven years, composing and living for the most part at a marginal level. During the 1960's, the level of technology available to the unaffiliated musician without means, was not attractive to ; me. I worked, rather, on more basic musical matters, hoping that my music would be performed, but normally proceeding without prospect of public hearing. Even after returning from my last foreign residence, which was in Japan, even after I took up a post at the

University of California, San Diego, technology continued to appear impractical in more than a modest supporting role. The musical rewards were simply not, in my judgment, worth the investment.

In 1978, however, the International Computer Music Conference was held at UCSD, and there was a full evening presentation by the group from Stanford University's Center for Computer Research in Music and Acoustics. Their presentations, ending with a performance of John Chowning's quadraphonic tape composition, *Stria*, were decisive. They demonstrated command not only of undeniably intriguing theories, but also of their compelling sonic manifestation. There were, in short, both the enticements of theory and of experience. The following summer, I went to Palo Alto determined to find out what I could about the possible meaning of the computer to my musical life. Late in that summer of feverish intensity, I had a tranquil lunch with Chowning. He was as measured as always, but recognized, I suppose, my excitement and the fact-as little as I had actually grasped-that I was at least glimpsing the horizons with which he had been concerned while building his seminal facility. He spoke of living "at the edge of imagination," and it is his phrase that I gratefully borrow for my title here. I have referred to time-sharing environments several times. Since the computer can perform certain numerical tasks very rapidly and the human being has a habit of considering for a moment before asking a question, a natural consequence of combining the two is that a powerful device will lie idle much of the time, awaiting the next demand for calculation. In earlier years, when digital technology was still relatively expensive, it made imminent sense to develop very large time-sharing machines which attended to the demands of a large number of different users in extremely rapid sequence. The response was quick enough so that an illusion of individual service was maintained. Recently, technology has developed to a level that has made personal computers a reality. A crucial aspect both of large-scale, time-sharing computers and their personal descendants is that they are *general purpose* machines, devices that can be programmed to serve an extraordinarily wide range of uses. The computational environment in which I found myself at Stanford in the summer of 1978 had originally been established not for music but for exploring artificial intelligence. Not surprisingly, a group of persons and machines assembled for the purpose of simulating human behavior found some interest in the simulation of music-like behaviors, or, indeed, of music itself. It is worth noting in passing, however, that these are by no means inseparable goals and that they are often confused.

The making of music is, in its historical manifestations - but *not necessarily* - a social phenomenon; the time-sharing computer environment is also one in which a community of diverse experience and expertise plays a fundamental role. One notes a great deal of solitary concentration (it is not unlike what I have recalled my father doing) but also frequent interaction - the sharing of tactics, insights and even commiseration. There is patient, systematic planning; delayed gratification; the inevitable documentation that programming involves; and most of all, the continual buffeting against the implacable fact that the computer does only, and

exactly, what one tells it to do. I believe that the maintenance of a diverse community of users in some proximity to one another is essential for optimal results as we continue to attempt the incorporation into our lives of this tool with incalculable potential. Since my earliest experiences with computer music, I have continued to ponder the balance between three factors: the rigors of musical training, the importance of maintaining the incomparable flexibility of general purpose computers, and the demands inherent in attaining technical command of the computer's potential.

The ideal would require, it seems to me, the combination of three resources: a superb musical gift, thoroughly trained; a completely general and yet rapidly responsive machine with unlimited memory; a complete command of all the relevant technical issues (psychoacoustics, digital signal processing, hardware and software design). The sacrifice of any of these components evidently limits the individual's horizons in some way. Musical failings impact the art, machine limitations circumscribe the free range of imagination and scope, technical incompetence cripples one's awareness of opportunity or his ability to seize it. The manifestations of such compromises are everywhere to be seen: superb scientists with the musical experience of amateurs, admirable musicians with spotty technical backgrounds, machines invested with capabilities that are driven by commercial criteria. The most pernicious of these (because it is less subject to the aggregate mitigation of expert skeptics) is the current trend towards facile packaging of digital capabilities. As affordable commercial devices become more and more widely disseminated, the generality of our current (ideal) horizons inevitably withers. The university, in particular, must not become a mere user of off-the-shelf technology; it must not submit to pop ideals. It must not content itself with special purpose devices which have built-in limitations. The university has an obligation to provide principled leadership. In the arts today, part of that obligation is to preserve not only creative work itself, but also the tools which allow such an unbounded exercise of the society's free but fragile collective imagination.

We are all aware that traditional musical machines-pianos, flutes, bassoons-are limited. Limits allow mastery, the gradual understanding of that which is idiomatic to any system. In the case of the digital devices now appearing, however, limitations are mandated by a few consultants and - to paraphrase Whitehead - by the fact that good instruments must look and feel like those with which we are already familiar. This situation involves the relegation of the third part of my ideal triad to a before-the-fact design stage. Technical expertise is no longer an interactive component of the musical situation. Those who possess it decide for the musician what sort of controls will be available to him, and over which process they will allow him influence. I am not saying that the new breed of synthesizers, sampling machines, and the like are without interest or value. Rather, I am saying that, from the point of view of a university environment or of the (ideally) unbridled imaginative worlds of the composer, one must be alert to and resist limitations imposed according to inappropriate criteria.

It may be fitting, here, to indicate something about the edges in my own imagination, and why the foregoing remarks are a matter of such intense personal concern. I have written elsewhere about the notion of the composer as a performer *out-side of time*. Consideration of what one is about to do necessarily distracts some portion of one's attentiveness from the performing of the action itself. Something has to give: the quality of the consideration, the quality of the performance. Habit enters. What about reconsideration? More time. More disruption of performance. What would "real time mathematics" mean, or "real time philosophy?" Rapid response is without question a crucial matter, but we must also conserve generality 1. *A Searcher's Path, A Composer's Ways*. (Brooklyn: Institute for Studies in American Music, 1987) of access or process, not sacrifice it to the dictates of performance immediacy. There are *separable* issues here. Performance is one thing. I have mentioned that musical instruments *must* be limited. If one considers the application of computers to music-making, however, performance is not the only point at issue.

As a composer, I offer three areas that have interested me in coming to know something of computers: the spatial dimensions of sound, the creation of structural formats that display various sound sources in novelly related fashion, and the development of algorithms that allow the transformation and extension of musical materials in ways paralleling that of traditional canonic techniques. I have been concerned with the first of these—the formal and expressive use of space—for more than 25 years, beginning with a piece called *The Emperor of Ice Cream* (1962), in which eight singers spread across a stage passed a sequence of syllables smoothly from one to another. Recently, I have been working with my colleague F. Richard Moore's *cmusic* unit generator, *space*. Through appropriate interfaces, it allows one to specify complex paths for sound sequences to traverse in space, and also provides the means for characterizing the host spaces in which the specified movements are to occur. *cmusic* is a sophisticated and very general set of programs through which the trained musician can efficiently and flexibly synthesize new musical materials or process sounds from the real world that have been digitally recorded. It is built, as were its important predecessors, on analogies with our musical traditions including "note statements" which describe sounds and "instruments" or "unit generators" that act as characteristic allies (such as the piano or the concept of key have been in the past). Moore's program allows one to simulate the movement of sound in a space manifested through several loudspeakers. What inventions like Moore's do is to unshackle the composer's imagination. *Space* opens to creative fancy an entire area of musical effect formerly hobbled by the grim realities of physics; musicians themselves can never be as mobile as the sounds they can float upon the air.

The painter Monet had unparalleled vision. Coupled with his capability in dealing with color and texture under changing illumination, it resulted in the emergence of *circumstance as subject*. Sets of works depicting the (in some sense) *same*

haystack or cathedral facade resulted in experiences of breathtakingly different effect. The object was not varied but rather the context of illumination within which it was experienced. I have used the computer in an effort to parallel such a phenomenon in music. Of course in the case of art, a number of visual representations can be presented side by side on a gallery wall. In such a setting, both the individual wholeness of each work and the relative distinctions between the versions can be assessed. We have only to step back from the display to gain the necessary perspective. But how can a listener be both within the inevitably sequence- bound domain of musical form and still be involved in relative, extra-formal comparisons? Visual art allows differing degrees of processing completeness, a '(fast- forward" mode that music forbids.

In approaching this problem, I have designed a paradigm which will convert any one-minute source sound into a four-layered, five-minute movement. I have made four such movements in which totally distinct original sound sources of the same length are distributed in time and space in precisely identical ways. 2 What I would like the listener to be able to hear is the way that differing materials cast their influence over an unchanging formal object. The 'object" comprises a set of ordered windows in time and space through which the source sound can be heard. Compositional algorithms determine how the source is fragmented, replicated, and reordered in time. Moore's computer program specifies paths in the illusory spaces that determine the position of each sound fragment. Each window has two sets of times associated with it: the boundaries of its beginning and ending times within its original context, and those that place it in the newly imposed formal field defined by the paradigm. The four layers in each sonic object are *exchange* (materials are reordered), *special focus* (involving greater proximity and rapid movement), *intensification* (a proliferation of accelerating fragments), and *interpenetration* (elements in the original source are greatly elongated and superimposed on one another). (2. It is important to note a very substantial debt in this work to my musical assistant at the UCSD Center for Music Experiment, John Stevens.)

The four movements of the resulting set, called *Versions/Stages* are based upon a composed theme for cello, a speech by Japanese actress Shiraishi as Dionysus, sounds collected at the Pacific's La Jolla Cove, as well as the gentle trickle of a small water- fall. Although these sources vary widely in their complexity and formal differentiation, the indelible stamp of the single shared form is vivid. Form is, without a doubt, experienced as separable from content. Finally, at a slightly less abstract level, there is the important matter of extrapolating any method arrived at within the domain of computer music to, some might say, the larger, external world of more conventional instrumental music. Methods that are useful in dealing with local phenomena may fail when asked to define a larger span. A procedure (an algorithm) that might generate commendable bricks could fail in describing a wall. This is one sort of methodological limitation. Another might be the degree to which a manual application in the realm of instrumental music is feasible. I have written several

instrumental pieces in recent years in which the musical fabric was derived from combinations of small segments whose boundaries were defined by computer algorithms. The source material for these works is to be found in brief, fully composed thematic elements, the function of which parallels that of a canonic subject. A complexly referential music is woven, then, not from germinal motives as one finds in Haydn, but from formally constrained sets of fragments quarried from complete, though concise passages of germinal music. While the traditional compositional algorithm, canon, has produced music of extraordinary elevation (an aspect of which is to be found in the listener's sharing of its organizational parsimony), the procedure itself is elementary. The computer now allows one to test assumptions of greater procedural complexity with relative ease. The composer must, of course, get beyond the deliberate, conscious act to the extra-rational realm of intuition. In order to do so, he requires abundant experience. The computer allows even a very intricate set of assumptions to be manifested and mused over repeatedly so that the sublime authority of the unconscious can be tapped. Such composition, relying on algorithms for its intermediate level of organization, employs no additions, augmentations, or transpositions relative to the original material. All the music results from a by-rule fragmenting and placing of the original material in time, a process indebted to the computer.

Subsequently, the composer resolves dilemmas produced by the occasionally "impossible" conjunctions of performance demands that the algorithmic process can spawn. As a result of engagement with the unparalleled generality of the computer, it has been possible to pursue many aspects of my musical imagination that had been constrained by conventional realities. New flexibility-available to all-comes at a price, however. One must, as I have suggested, learn a good deal, not only in the realm of procedure but with regard to patience and interdependency with others who possess essential expertise. The result has seemed to me well worth the effort.

I have been able to manifest music in forms that were, if not beyond the edge of my imagination, certainly beyond its capacity for implementation. Whether or not a composer decides to commit a large proportion of his energies to engagements with the computer in its various guises, it is unthinkable that education in our time fail to apprise him of its potential. Some of the concerns raised here are of ethical status, and merit far more attention than our artistic community appears inclined to give them.

Robert Scott Thompson (United States)

Robert Thompson trained as a composer of instrumental and electroacoustic music earning the B.Mus. degree from the University of Oregon and M.A. and Ph.D. degrees from the University of California at San Diego. He has created work in a wide variety of forms ranging from chamber and orchestral music to works for the virtuoso soloist, computer music and video and performance art. He is the recipient of many prizes and distinctions for his music including the First Prize in the 2001 Pierre Schaeffer Competition (Italy) and awards in the XVI Concorso Internazionale "Luigi Russolo" (Italy), Irino Prize Foundation Competition for Chamber Music (Japan), and Concours International de Musique Electroacoustique de Bourges (France), among many others. Currently an associate professor of composition at Georgia State University in Atlanta, he was a Research Associate of the Center for Music Experiment Computer Audio Research Lab throughout the 1980s and had a hand in the development of computer music synthesis techniques, MIDI and real-time computer music systems in addition to assisting significant composers from around the world in the realization of advanced computer music works. In 1991, he was a Fulbright Research Scholar and Composer in Residence at the Danish Institute of Electroacoustic Music where he collaborated on fundamental research, lectured about his compositions and compositional methods and composed the long-form computer music work – *The Strong Eye*. Over the past decade, he has become increasingly well known internationally for his instrumental and computer music works and also for his many ambient recordings which have been broadcast worldwide. His music is published on recordings by EMF-Media, Neuma, Drimala, Capstone, Hypnos, Oasis, Groove, Lens, Space for Music, Zero Music and Aucourant record labels.

While composing and recording takes up most of his creative time, he is also involved in important tangent activities. He is owner of the independent record label, Aucourant Records, which he established in 1986 and has recently expanded the scope of his activity to include distribution collaborations with more than 20 labels both national and international. He is also active as a mastering engineer, creating master recordings for labels such as Funtone and CRI (Composers Recordings Inc.) and for the Presser music publishing company. On the technical side, he collaborates with MicroTechnology Unlimited, an audio software company based in Raliegh, NC, and recently assisted in the development of DNOISE - a real-time digital audio noise reduction software application. He participates in a similar way with the Composers Desktop Project of the United Kingdom with the software design and implementation team and is serving as project director and editor for a new book on computer music synthesis techniques featuring the CDP software suite. He was a collaborating author for the book, *Computer Music Techniques for the Electronic Musician* published by Focal Press in 1998. He is currently working on a new text for A-R Editions concerning the use of computers for musical signal processing.

3) Eclipse

10:00 2002

Composed in June of 2002, Eclipse has no specific technical agenda and seeks only to express a poetry of sound. It was created using a variety of acoustic sound sources and with Kyma 2.56 and the Capybara 320 sound computation engine. This sophisticated system provides the means to explore sound in a re-combinant fashion and in real-time. Conceived as a true musical instrument, rather than a simply a computer processor, Kyma was invented by Carla Scaletti and Kurt Hubel and is manufactured by the Symbolic Sound Corporation in the U.S.A.

PULSE FIELD

SoundScape V

Disc III

Riccardo Santoboni (Italy)

Riccardo Santoboni was born in Rome. Degree in composition and in Computer Music, specialising in composition at Accademia Nazionale di Santa Cecilia in Rome and at Accademia Musicale Chigiana of Siena. He also studied physics at Rome University. Winner of several competitions in composition among whom: Cemat 1998 and XX Russolo competition –first prize). Prized in 1998 by INMC (International New Music Consortium –New York University-) for "his outstanding contribution as composer and promoter of new music". His compositions have been performed in Europe, USA, South Korea, Malta, South America. Some of his works are available on CAPSTONE Records CD (USA) and published by "Agenda, Edizioni Musicali". He is a critical reviewer for contemporary and computer music at *CD classica Magazine*. He is the artistic director of the International Competition of Computer Music "Pierre Schaeffer" of Accademia Musicale Pescarese. Visiting professor at New York University, (USA) Department of Music, faculty of Composition and faculty of computer music, in 1998, 2000, 2001. He taught Musical Composition; Acoustic Physics & Psychoacoustics; Electronics, at Rome *Università della Musica*. He teaches Computer Music at Computer Music Masterclass of **Accademia Musicale Pescarese** (Pescara) and "Musical Composition" at **Conservatorio of Bari**. He also taught Computer Music at the summer masterclass in Computer Music at the **Accademia Musicale Chigiana** of Siena (1996) . His musical research deals with psychoacoustical perception of musical events, subordinate by mathematical deterministic and chaotic structures. He wrote: "Strumenti a fiato" a book about physical modelling of wind instruments; (published by "UM, produzioni editoriali" in 1997) "Tecniche di Sintesi" a book about Computer music synthesis techniques; (published by "Research@press-Bari)" in 2001 "Istituzioni di Fisica Acustica per il Musicista" a book which drives the musician toward the world of physics in Music; (published by "Research@press-Bari)" in 2001.

1) Rumours

7:44 2002

*A Corrado Canonici,
who made this work possible.*

Every plurality may hide a common root. In the piece "Rumours" for tape and double bass, I looked for a plurality of sounds from a common root: the double bass; sounds from tailpiece, from "beyond the bridge", and more common way of strings exciting, were sampled, analyzed, partials stretched, granulated, vocalized, convolved each others, and convolved with voice, partials wave shaped.

Live doublebass interacts with this material, with opposition, with integration, or completing digital sounds. The piece begins with a doublebass low pitch; its queue, is the all development of the piece. I thought as a chrono-microscope where a little time quanta becomes a complete musical form, with its climax and its different zones. So, the piece ends with the altered resonance of the first pitch. Some samples used for electronic sounds, or some builded up sounds (in additive synthesis) were chosen because belonging from the same acoustic source: a string, a "plane" of string (membrane- tambourine) a volume of strings (build up bell-like sounds, with increasing partial number).

In the work there is always a dialog between live doublebass and tape: sometime

doublebass give the excitation energy and the tape immediately reacts with resonance or vice versa; sometime the response is delayed. I also used high harmonics of doublebass in order to be fused in complex spectra of tape, when I wanted timbre integration.

**Perceptive decoding and musical structures:
Some hypothesis on an harmonic-perceptive theory**

(published in 1998)

Riccardo Santoboni

Conservatorio di Musica di Bari

Accademia Musicale Pescarese

Abstract

Human signals perception through acoustical stimuli starts at least two processes for the decoding and the cataloguing of the stimuli: signal analysis and signal comparing. Signal analysis is an automatic feature of the human acoustical chain, and so is not dependent by cultural background and historical collocation of the listener; signal comparing is related to all the acoustical experiences stored in memory, which are called "Perceptive tonics". For musical events that are linked to the arrow of time it is very important to consider the characteristic of the human temporal memories. Perceptive tonics are related to a recognisable acoustical source; with computer music we can modify acoustical sources or build new sounds associate with no know acoustical source. We can introduce a semantic index for the recognition of acoustical sources. Moving this index we produce a family of sound materials that are gradually divergence from the original. Therefore we have a sort of "dissonance" from the original material, related to the growing of semantic index. In this way it is possible to structure a theory of consonance and dissonance, similar to classical harmonic theory. The reiteration in time of some sounds events produced a sort of attraction for others sound materials. So the more iterated is sound material in the piece, the more is his strength attraction. In other words the strength attraction of a particular sound event is proportional to the sound characteristic of what a listener stored in his memory.

Introduction

A sound signal is a pressure wave with frequency and intensity values suited in the listening field. The complex motion of air molecules is then converted in sound sensation when the ear system is reached by this kind of pressure wave. In order to recognize the kind of acoustical source in real time, we need a catalogue of similar sounds stored in our memory. In this way as soon as the sound is perceived, the body will react consequentially. Sound of a bell is a semantic sound with different meaning for different civilities and for different times, but even if the sound bell is high or low we associate the sound to a generic bell and to the related meaning. It seem that in our memory sound are catalogued in different categories; for instance the sounds of traffic belong to a set, the sounds of strings belong to a different set. Sound categories seem to differ by perceptive contest from whom they belong: if an acoustical stimulus belonging from a perceptive category is present in a different category, human perceptive mechanism start a comparison and an eventually upgrade of acoustical archive stored in memory, adding in the fixed category a new link with the foreign stimulus. If the stimulus doesn't come from any known source, as often happen in computer music, the comparison and the search for new link are more intensive, even new categories can be build from mind. If the sound come from synthesized sound not present in our acoustical background, the material appears to be "neutral" because we can no compare or catalogue in any categories. A reiteration of neutral materials during the evolution of a piece, change the peculiarities of neutral sound in recognisable sound and therefore with the properties of a perceptive consonance (no tension zone). Categories are not only timbre categories, but also historical categories and ambient categories. If we listen to a sound with 4.5 s of reverberation time, our mind figure the acoustical source in a church or in a big buildings with almost no absorbing walls. Also 4 seconds of a Vivaldi sample of the 4 season, immediately project us in a determinate historical period. What is really interesting in composition is to stimulate the mind to a continue comparison and misunderstanding of the stimuli. For instance a car horn sound with the glissando of Doppler effect, can continue with a string section who continue the glissando; two different categories are involved and the listener is forced to compare the stimuli, doing in this way an aesthetic and active listening, without the listener be pushed by sound events. Misunderstanding of messages in composition is a big chance to raise the attention of the

audience; I usually call them “semantic short-circuits”. Also orchestration is a misunderstanding of original timbre of each instrument: when we use different section together, what we do is to build a new colour of sound (additive synthesis) from original source: a sort of timbral misunderstanding. Recognition of sound is therefore related to quotation; quotation of a string sounds, or of a reverberation time or of an historical context. With the linking different quotations we are able to use a new parameter for composition: the semantic index. [...]

Consonance is related to what the listener knows: if fact consonance means no tension, and if the stimulus is known, no tension or weak tension is generated. Dissonance is related to what listener does not know or what he does not wait for. High tension is generated, tension who may be solved with a consonance event. [...]

In this way we can realize a theory of consonance and dissonance similar to functional harmony theory. We can produce areas with strong consonance (or with weak dissonance) and vice versa. Each area is in any case related to previous and following ones.

[...]

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Andy Birtwistle (United Kingdom)

I am an audio artist, film and video maker and currently Principle Lecturer in Video at Canterbury Christ Church University College, UK. Originally trained as a filmmaker, I first became involved in the British independent film and video scene in the 1980s. I went into voluntary exile during the 1990's, but now return (like scratch video) and continue to make low budget and no-budget work. Working now as an academic, my research interest in sound has prompted me to shift my own production work from film to audio construction. My audio work explores the relationship between sound, film and critical theory.

2) Steel II

9:43 2000

Dickon Reed -narrator
Shu-yang Chia -mandarin voice
Michael Gubisch -german voice
Peter Cook -trumpet

In 1937 the poet Geoffrey Bridson produced *Steel- An Industrial Symphony* for the BBC. The programme, a symphonic sound poem, celebrated the manufacture of the ultimate modernist material: steel. Industry, at the service of a Modernist idealism, was to build a new world. I began *Steel II* (2000) with two questions: how would an optimistic, heroic Modernism sound in the 21 st century, and how would the new century sound in contrast to the last ? *Steel II* celebrates and mourns the failure of the Modernist dream represented by Geoffrey Bridson's 1937 broadcast. Now, the proud trumpet fanfares of the 1930s have lost steam, and transform to the dissipated anal rumblings of modern broadcasters. *Steel II* is a 10 minute slab of sonic flatulence, a cloud of voices and sounds to herald the dribbling into being of a new era. The sounds for this new millennium are weak and gently folded, at other times they are strained and confused, copied and cut up -but long gone are the timpanic fantasies of the Uber-broadcasters, the Uber-poets and the Uber-composers. *Steel II* celebrates the beauty of confusion, compression, and release from structuration.

The piece features the sounds of steel, flatulence, dissolving trumpet fanfares, and a moody BBC narrator translated into Mandarin and German. One of the key ideas behind the piece was to explore contemporary post-structural ideas by rubbing them up against a classic modernism. In particular I was interested to read an article from an architectural journal that explored new ways of thinking about how elements can be combined in buildings. It took as its starting point culinary manipulation, and thought through how whisking, chopping, mincing and grinding could serve as conceptual models for a rhizomatic form of architecture. The Deleuzian notion of the rhizome challenges modernist notions of individuation and specificity, and this idea influences how *Steel II* develops both in terms of style and content. The BBC narrator, although occasionally barking at the listener for drifting attention, constantly drifts himself -listing objects with no apparent connection, luxuriating in culinary vocabulary, inventing names for new sciences. The mercurial, liminal aspects of sound resist easy subjugation by modernism: the narrator's lesson in the sound of elemental geometric forms is meaningless. Rather it is drifting, rhizomatic shifts that mark contemporary art and media forms, as well as our own experience of sound, and indeed of consciousness itself. Such are the sounds that herald a new era -perhaps one of dissipation, but also of tremendous creative opportunity. But the nostalgic pull of modernism tinges the arrival of a new era with slight sadness. The piece finishes with the dribbling into being of the new millennium, marked by the occasional mumblings of the narrator and the sounds of the millennium celebrations held on New Years Eve 1999, with their depressing suggestions of warfare.

Benjamin Broening (United States)

Benjamin Broening's compositions have been widely performed across the United States and in Europe and Asia. He has written works for many media, including orchestral, choral, chamber and electroacoustic music. Recent pieces include a work for clarinet and piano commissioned by the Band and Orchestral Division of Yamaha Corporation of America for Arthur Campbell, a work for clarinet and electronics for F. Gerard Errant and a choral/orchestral work for the Connecticut Choral Society and the Grace Choral Society of Brooklyn. Other recent commissions include a cantata for the Charlotte Symphony and the Oratorio Singers of Charlotte, a clarinet concerto for the Interlochen Arts Academy Wind Ensemble, a multi-media cantata for Hampton-Sydney College, chamber works for Quorum Chamber Arts Collective and Currents new music ensemble, three choral works for the Virginia Glee Club, an orchestral piece for the Riccioti Ensemble (Netherlands), music for theater and dance, as well as numerous solo works for performers around the country. His *Variations/Doubles* has been released on the Equilibrium label, *Via Negativa: The Cloud of Forgetting* has been released on the Centaur label, and his *Arioso* and *Arioso/Doubles* will be released on the Centaur label in 2003. Broening is the founder and artistic director of Third Practice, an annual national festival of computer and electronic music at the University of Richmond, where he is Assistant Professor of Music and Director of the Computer Music Studios.

3) Via Negativa: The Cloud of Forgetting

5:03 2002

Via Negativa: The Cloud of Forgetting takes its title from the 14th century Christian mystical work *The Cloud of Unknowing*. I came across this work a few years ago and was struck by current secular (per)versions of its idea that the denial of the external world is a means of attaining Truth/Happiness. The temptation to willfully forget or ignore and the temptation to embrace repression are very much with us. Material and intellectual Comfort, it seems, has replaced Contemplation as the elevated state to which we aspire. *Via Negativa: The Cloud of Forgetting* is not a call to reanimate the Christian values of a time long past; rather, it is part of a personal effort to combat Comfort's seductive solutions, and to preserve Contemplation as a value in my own life in sound.

Jan Jacob Hofmann (Germany)

Born 17.6.1966 at Duesseldorf, Germany. Final high-school examination in June 1985. Beginning of study, branch of architecture at the Fachhochschule Frankfurt /M, University of applied sciences in Sept. 1987. Diploma in Feb. 1995. Entered the class of Peter Cook and Enric Miralles at the Staedelschule art school Frankfurt/M in Sep. 1995, a postgraduate class of conceptual design and architecture. Diploma at the Staedelschule in Nov. 1997. Since 1986 dealing with sound- composition and electronic music. Interchange of architectonic ideas to music and vice versa. Worked on the »Sonic Architecture« -project from 1998-2002.

Notes on the Music

Jan Jacob Hofmann

How would it sound like, if there was an electroacoustic sound in the room where you are, being 3.5 meters above your head behind you to the left, sounding like the knocking on a metal beam, a wooden object or the sound of a glass broken. Or, even better, something in-between them, something artificial. Carbon-fiber, liquid ether, a sound of a material not yet invented, maybe objects that seemed vivid. Were we able to imagine how this object would feel like, if we touched it? Could we guess by the sound if it was hard or soft, transparent or solid, smooth or as rough as a rock? Would we be able to sense its temperature or have an impression of colour? If it was totally dark in the room, would we imagine an object? Would we be able to guess its size? Maybe even its approximate shape? Would we associate a spherical object if the sound was like that? Or, if it had irregular shape, would we hear this? Could we tell if it was hard edged and defined, or blurring into the space? How would a transparent, gas-like material sound like, how a swarm of little grainy objects in space? If we had several of these objects, moving independently through the speakers, how would they relate to each other? Would they modify the space you are in? Would it be possible to imagine the shape of the space created by the voids in-between the sounding objects? Would the space change as the sounding objects change? Would this result in an architecture enriched by the quality of movement and constant change?

»Sonic Architecture«

...is spatial music, architecture made by sounds. The sonic material generates sonic space containing sonic elements surrounding the listener. My approach is an architectural one, as I am an architect working with sounds: Sounds are treated as freely moving elements in space, interacting with each other, being involved in a process of development as they generate gestalt, define and modify space.

Technical notes

These sound compositions are done with Csound in 2nd order Ambisonics. Both, the electronic sound and the spatial image are created using Csound. Csound is a text-based computerprogramme for sound-synthesis with the computer, once developed by the MIT, now being maintained by several people around the world, as it is open source now. The material is encoded spatially by using the 2nd order Ambisonics method and can be decoded to any symmetrical speaker setup and any number of speakers. 2nd order Ambisonics is a method to create a soundfield all around the listener using an encoding and decoding process. To emphasize the spatial impression, depth is added by simulating a pattern of early reflections sensitive to the location of the sound as well as several other distance clues. Research on Ambisonics is done at the Universities of York and Derby. The programming of ambisonics-equations into Csound was done by Jan Jacob Hofmann himself.

4) Condensations

8:46 2002

This piece deals a lot with the gas-like quality of the sound, its position/ movement in space and the continuous transition between single sounds towards a multitude of particles and vice versa, generating different states of order and disorder, according to the energy/ velocity, the particles seem to have. As the energy decreases, order increases. Also complex shapes are generated by superimposition while this process takes place.

Massimo Carlentini (Italy)

Carlentini completed his studies in piano and took his final diploma. He also completed his studies in Electroacoustic music with Alessandro Cipriani. He has studied composition and he has attended several masterclasses with E. Morricone, K. Stockhausen, B. Truax etc.

Mr , Carlentini ' s music has been selected and performed at various festivals: "Concerti per Compositori" (Novara 1998), "Corpi del Suono" (L , Aquila, 1998), at various musical events, in collaboration with the University, the "V. Bellini" Istituto Musicale and Theatre Massimo (Catania 1999/2002), "Musica Verticale" (Roma 2000), "Paz Para Viequez" (Puerto Rico 2000), "Universidad de Chile" (Santiago del Cile 2000), "International Computer Music Conference" (L ' Avana 2001), Maxis Festival/Symposium (Sheffield, England 2002), "Cycle concerts de Musique par ordinateur 2001102" (Parigi 2002), 32° Festival Sintyhesse (Bourges 2002), Seoul International Computer Music Festival (Seoul 2002).

Furthermore he has collaborated as a composer with video makers resulting in the production of two videos, projected at "Suonimmagine" (Catania 2000) and "Senza parole immagine e musica" (Parma 2001).

Mr. Carlentini won second prize at the XXIIInd International Competition "Luigi Russolo" (Varese 2000), Honorary Mention at the International Electroacoustic Music Competition "Musica Nova 2001" (Praga 2001) and finalist at the 29° Councours International de Musique et d' Art Sonore Electroacoustiques (Bourges 2002).

His pieces have been published by Ars Publica label, Fondazione "Russolo-Pratella"¹ C E C M, ICMC 2001, Suvini Zerboni and Society for Electroacoustic Music.

5) inverso-cosmico

11:17 2000

...to Riccardo Bianchini

The composition comes from the idea of one of the hypotheses regarding the creation of the universe, dividing it into three phases: the "Era Adronica" (the cosmic Big Bang), the "Era Fotonica" (the processes of cooling) dominated by radiation)) the "Era Barionica (the present one) of the gravitational type).

"Inverso Cosmico" has traced its way backwards through these aforesaid hypotheses: The "Era Barionica" a pseudomelodic line or the lifeline mixes itself with sounds of the senses or sensations (hot, cold, dark, light, evanescence,ever present);

The "Era Fotonica" rhythms with varying timbres or radiations that mix in sound bands or fluctuating materials;

The "Era Adronica", the reduction and expansion of fragments of materials used previously or the Big Bang, repeated through time.

The sounds of this piece of music, have been created through the modulation of frequency, and through granular synthesis.

6) Retrospettive di dioia

16:10 2002

This piece of music, looks from the outside and from different angles those that are the flashbacks of joy.

In effect, I have carried out a retrospective piece of research regarding happenings which preceded in time but which have determined present conditions.

The basic materials are fragments of sacred texts taken from the Bible; the actions, sounds and noises present inside the Church.

The piece is divided into different sections linked by small "backgrounds":

INTRO (3.09) -It is "the acoustic image" of the first elements which characterize the sacred place, "the house of Christ".

I: retrospective -it is a bass voice: The profound Being.

DIMENTICANZA (3.33) -it is the shadow zone, where everything is confused, uncertain, and our "lost r": attempts to reacquire, to ascend, to re-ascend, after having desired to forget the "Faith" that each one of us carries within.

II: retrospective -it is the prayer, sectioned and the flashback to the piece, giving testimony to the Faith, that is with us, but is now distant, it has been distanced: it aids us from afar, it does not abandon us.

ATTESA (2.27) -The Confession, the silence, the rosary are necessary in order to reacquire the peace that has been lost.

III: retrospective -it is the sound produced by the needle on a vinyl L.P: sweet company of a sound now in disuse: its projection is the past with the sense of the present.

MESSAGGIO (3.01) -A story from the Bible, it is the testimony of the story of God.

IV: retrospective- it is the repetition of a phrase: God is truly resurrected, the message of the Bible.

EVENTO (4.00) -In conclusion the song characterizes the final part: it is the joy of re-found peace, of re- found faith, of the love that we all possess within ourselves but are unable to bring to the surface.

V: retrospective -it is an acute sound, it indicates the Divine voice: it is the voice of God who speaks to Man.

The piece is dedicated to all the faithful Christians.

I would like to thank: Padre (Father) Caramagno, Padre Sanzio, Padre Sortino, who read the sacre text from the Bible; furthermore, Alfio Pitruzzello, bass voice and for his performance on the "traccola" the bell and the incense container; Alessandra Marino, bass flute; Marigue Camoca, double bass; ensemble of "Calamus" clarinets and the faithful present at the mass of 09/03/2002.

PULSE FIELD

SoundScape V

Disc IV

Kristoff K. Roll and Xavier Charles (France)

As I get older I get out less. This is largely the result of having small children and many domestic duties. Staying in changes how I listen to music. In previous decades music that I sought out socially in concert halls, clubs and festivals always appeared celebratory, regardless of its intent: as if its very structure and aesthetic were determined by its location. Staying in -listening to music mostly on headphones in snatched, private moments -renders the music private.

The music on this CD sounds like it doesn't get out much and I admire it for that. It seems content with its narrowed social world -or is that me? That is not to say that it's self-regarding. It appears to afford an array of perspectives on the notion of the social.

It has always seemed to me that music's most active meanings are those the listener wrests from it, interpretations 'Wrought from social activity', as Simon Frith has put it. With social activity comes a host of histories -of identity, of circumstance, of listening – in my case, of almost thirty years of listening to electronic music, electroacoustic music and free improvisation. These broad genres characterise much of the music here. The improvisations of clarinetist Xavier Charles ore by turns ruptured, invisibly mended and reconfigured by the 'acousmatic pratique' of Carole Rieussec and Jean-Christophe Camps.

Those almost-thirty years seem to make this music mine. Up to now, I've largely heard music as 'other' -as the music of composers, of performers; the music of external purpose, narrative, form -genetically or descriptively 'of' someone or something else.

The qualities that reside in this music reveal themselves to me as elements in a set of social relations, completed by my own self. *La Pièce* is the music of this particular listener. Its title is replete with meaning for me. *La Pièce*: the room (the domestic, the private); the play (a drama completed by my participation as listener); the part of a mechanism or a machine (its sound sources and their manipulation; again, a part that is made whole by the listener); a fragment (ditto).

Note the definite article: 'La'. This is not any instance of the above; it is THE instance. In an inconspicuous corner of the living room sits this music in a chair that fits it perfectly. Comfortable yet far from complacent. Undemonstrative but able to make the most expansive gestures with utter facility. Never histrionic, yet not afraid to assert what is necessary. Apart, but in the thick of it. I will only ever hear this music on headphones. This is the best music I've (n)ever made.

Excerpts from *Le Pièce*

- | | | |
|--|--------------|-------------|
| 1) Le couloir sans papier peint | 5:06 | 1999 |
| 2) Grange nocturne | 8:01 | 1999 |
| 3) Casco de hacienda | 15:03 | 1999 |

Richard Lainhart (United States)

- | | | |
|--|--------------|-------------|
| 4) Two Mirrors Face One Another | 40:00 | 1976 |
|--|--------------|-------------|

PULSE FIELD

SoundScape V

Disc V

Natasha Barrett (United Kingdom / Norway)

1) Prince Prospero's Party

16:03 2002

** Special 5.1 Surround Sound Version by the composer.*

Prince Prospero's Party' could be regarded as a 'sonification' of Edgar Allan Poe's short story 'The Mask of the Red Death'. The music follows closely the events and evocations found within Poe's text, and is my most narrative work to date. The structure unfolds through the seven rooms of Prince Prospero's chambers and the revellers they contain, and the listener is shaken by the increasingly terrible chimes of the great ebony clock. Although the story follows a path of inevitable doom and gloom, it has an overriding feature: the capacity to evoke an amazingly surreal, multi-faceted space within which the drama is placed.

The full story is easily found in most bookshops as well as on the Internet. Although not doing justice to the original, to aid unfamiliar listeners here is a brief outline of the story: Prince Prospero and many of his 'light-hearted' friends lock themselves inside the Prince's castellated abbey in an attempt to avoid the 'Red Death'. After six months the Prince holds a masquerade ball, for which the setting is the seven, irregularly disposed rooms of his imperial suite. The Prince's bizarre taste has each room decorated, from top to bottom, with a different colour, and stained-glass gothic windows whose colour varies in accordance with the interior. Opposite each window a heavy tripod bares a 'blazier of fire that projects its rays through the tinted glass... and produced a multitude of gaudy and fantastic appearances'. The last room is decorated in black, but with scarlet glass windows - 'ghastly in the extreme', and in this room stands the great ebony clock. Every time the clock chimes, the revellers are filled with fear. As the party progresses, a previously unnoticed masked figure resembling a stiffened corpse is present. With the strike of midnight the Prince demands, "who dares insult us with this blasphemous mockery?...". and the presence of the Red Death is clear.

The composition has been spatialised using second-order ambisonics (custom made ambisonics granulation software and Richard Furse's software 'Vspace').

Commissioned by: Third Practice electro-acoustic music festival 2002 and the Modlin Center for the Arts.

Paul Lansky (United States)

Paul Lansky is one of the most prominent and accessible of modern American composers who write primarily for the medium of computer-generated sound. He has made advances in purely technical areas, especially those of Linear Prediction Coding, which he developed for his own first computer-generated pieces, and Cmix (in the 1990s), a set of programs which he has made freely available. In the areas of theory and analysis, Lansky has collaborated closely with George Perle, a former teacher of his, in developing the latter's ideas of "twelve-tone tonality," a way of combining serial techniques with pitch-centered motion. Lansky is a thoughtful and articulate writer and speaker, and has written extensively on his own music. The metaphor most often used

by Lansky to describe his use of the computer is as an "aural microscope" (sometimes a "camera"), with which he "tries to make the ordinary seem extraordinary, the unmusical, musical. [I] try to find implicit music in the worldnoise around us." Like photographs, "recordings of real-world sounds ... create a nostalgic ache in that they almost capture events which are, in reality, gone forever," and Lansky's music can be extremely affecting.

Lansky began his musical career, after graduating from Queens College in 1965, playing French Horn in the Dorian Wind Quintet for two years. His first compositions, which were entirely acoustic, date from this period. They are all for chamber ensembles, though curiously (considering his later interest in manipulating sounds created by people, and especially vocal sounds) none use the voice. In his pieces from this period Lansky was mostly concerned with expanding on George Perle's ideas of twelve-tone tonality.

Lansky returned to school, and received a PhD in composition from Princeton University, where he has taught since. In the early 1970s, Lansky continued his use of Perle's technique in his instrumental writing, but also began to compose music solely for tape, such as *mild und leise* (1973). In this piece Lansky uses a few ideas which were to become very important in his later development. For example, timbre is used as a structural element (similar timbres tie together parts of a piece, much as a returning melody helps the listener with the structure of a classical piece). As well, Lansky uses previously written music as a jumping-off point for his work, a hallmark of his later style. In this case the music is that of Wagner (whose "Liebestod" aria from the end of *Tristan und Isolde* begins with the words Lansky uses as the title of this piece), and specifically the "Tristan chord," a half-diminished seventh chord. Similarly, in the 1978 piece *Crossworks*, for piano, flute, clarinet, violin, and cello, Lansky uses the relatively famous opening chord of the second of Arnold Schoenberg's *Fünf Orchesterstücke*, Op. 16 as a basis for a whole piece. Lansky thus was moving away from the manipulation of abstract pitch sets (he co-wrote the article, with Perle, on "Set" for the *New Grove Dictionary of Music and Musicians*) to working with fragments of music that already had built-in associations for the listener.

The *Six Fantasies on a Poem by Thomas Campion*, completed in 1979, mark a turning-point in Lansky's career. Since this piece, Lansky has written almost solely for computer-generated tape (Lansky first combined computer-synthesized tape with traditional acoustic instruments in *As If* for string trio and tape, completed in 1982, and since then has composed only occasional pieces involving acoustic instruments, such as *Values of Time* (1987) for string quartet, wind quartet, and tape; almost all include a computer-generated tape part). There are several compositional and technical concerns, which have become central features of his music, which made their first appearance in this piece. Lansky based this piece on a reading of the poem "Rose-cheeked Lawra" (published in 1602). The reading is by Lansky's wife Hannah MacKay, who has been the original voice upon which a large proportion of Lansky's music is based. Lansky has written that he sees a strong similarity between the reading of a text and the performance of a musical score, so that he uses both as sources for his computer-generated extrapolations. All his music after the *Six Fantasies* is based in some way on the manipulation of previously generated sound: usually a musical performance or reading of a text, although Lansky often uses conversations as well. The *Six Fantasies* also marked the first time Lansky used the Linear Predictive Coding (LPC) algorithm to alter his given sonic material, and this technique has been common in his music since. LPC, which has also been used by other composers (Andy Moorer and Ken Steiglitz, for example), was originally developed at Bell Telephone Laboratories to compress speech for efficient transmission; it is designed especially for modeling and manipulating the human voice, and so fits naturally with Lansky's compositional concerns.

Lansky has written that "[his] goals are not mainly to achieve relative mastery of one form or another ... as they are to experiment," and his music throughout the 1980s and 1990s is quite varied. However, the pieces can generally be divided into several distinct, though related, streams, based on the subject matter used as a basis for manipulation: previously existing music, ambient urban sounds, or the spoken word (either the reading of a text or an improvised conversation). The main factors in common to his pieces are that the original sound is created by

human activity, and that they "all attempt to look at ... familiar things from new vantage points, using a novel perch to gain a fresh perspective on things we may have come to take for granted." "For me," he has written, "success means creating new ways of listening and hearing." Lansky used found music most often in his earlier computer-synthesized tape pieces, such as the *Folk-Images* suite from 1981, which consists of settings of folk melodies from Cecil Sharp's anthology (with one original piece in a folk style). Lansky later added eight pieces in 1991-93 to make the album *Folk Images*. Among other things, his goal in these pieces has been "as in many of my other pieces, where I attempt to confront our perceptions of things which we take for granted, these highly filtered images of folk music are meant to develop new perspectives."

Lansky has used ambient urban sounds in only a few pieces, and they have tended to be not quite as successful as those based on music or speech. In *Night Traffic* (1990), Lansky processes the sounds from a local four-lane highway, while in *Quakerbridge* (1990) he uses the sounds of a shopping mall as source material. More interesting has been the combination of voice and other sounds in *Table's Clear* (1990), an interpretation of the sounds of his two sons clearing the table after dinner.

Lansky has written that composing for tape entails very different strategies than composing for a live audience, which are needed to make his works (which exist only on recording, thus staying exactly the same with each "performance") "remain lively on repeated hearings." Lansky's most successful solution to that problem has been his music based on the spoken word, perhaps because either the text or the speaker has personal importance for him. Usually, the speaker is Lansky's wife Hannah MacKay, a trained actor. Often she is reading a text that Lansky has written (as in *Things She Carried* (1996), a "computer 'opera' "). Equally often, Lansky has set conversations between himself and his wife (as in *Smalltalk* from 1990), using the words to "trigger" music, by activating the pitches implicit, though not heard, in the spoken word - the effect is similar to that of Steve Reich's *Different Trains* (1988), where the pitches of short phrases of speech are reiterated by a string quartet. Lansky's goal is, as always, to make the listener hear the music behind all voices: "I fundamentally believe that voice, speech and music are inextricably intertwined."

Another strategy Lansky has developed to engage the listener is worked out in the series of "idle chatter" pieces: *Idle Chatter* (1985), *just_more_idle_chatter* (1987), and *Notjustmoreidlechatter* (1988). Lansky uses recordings of people speaking, with the words cut up so that they are (just) unintelligible, with the effect of a huge, chattering crowd (the sound is curiously similar to that of Jean-Michel Jarre's *Zoolook* album from 1984). His intent is for the listener to "lean forward" to try to understand the conversations, "not to bewilder, but rather ... the randomness and complexity of the texture creates a listening environment which encourages the ear to wander and be curious."

Lansky has described his theories of how technology is changing the relationship between listeners, performers, and composers. For one thing, he says, "the respective roles of concerts and recording have been switched. Recording is the norm and concerts are glorifications of recording." This reversal of roles, Lansky believes, has implications for everyone involved in music that have not been sufficiently thought through. Technology has also resulted in more people being able to contribute to musical life, especially "instrument builders" (a term he uses to describe both designers of acoustic instruments and music software programmers) and "sound givers" (anyone who distributes recordings), though Lansky has distanced himself somewhat from the latter concept.

--David McCarthy -- mccarthy, david\lansky.txt, All Music Guide

2) Ride

16:03 2002

* *special 5.1 Surround Sound Version by the composer.*

Ride (2000) has a predecessor in *Night Traffic* (1990), (Bridge CD 9035, Homebrew). The latter was based on a recording of a local four-lane highway in Princeton Junction, New Jersey. *Ride* is based on a new recording of the same road, but now this material is embedded in a richer and more complex texture. The work attempts to capture the sensation of being *on* a ride through various landscapes, towns and villages, rather than the experience of watching traffic pass by. The work also exists in an 8-channel version. Its grand orchestral manner is not unlike that of its elder sibling, which a friend of mine once described as "*Tod und Verklärung* on wheels"

I look forward to the day when nobody will care whether or not a computer was used in the process of making a piece. If any kind of music is to survive it has to hide its technology. (After all, virtually everything that is recorded today involves computer mediation to some degree.) To my mind, 'Computer Music' should become irrelevant as a distinct category. While it's obvious that computers can do things with sound that have been previously unimagined and unimaginable, I remain convinced that what we hear as 'music' has everything to do with the voice of the utterance—what is being said—and little to do with the machinery it uses to speak. Or, in the words of the song 'It ain't the meat, it's the motion.' But, since you asked, aside from the pre-recorded sounds, all the music on this CD was created entirely with software on a Silicon Graphics workstation and Apple iMac computer. The basic pieces of software used were Cmix, Rt, and SuperCollider. More detail can be gleaned from my web page at <http://www.music.princeton.edu/paul>.

The Inner Voices of Simple Things: A Conversation with Paul Lansky

Jeffrey Perry

[This article is based on a conversation conducted on July 7, 1995 at Paul Lansky's home in Princeton Junction, New Jersey.]

A Network Model of Music

JP: In a 1990 article in *Perspectives of New Music*, you consider music as a process of network building. Besides the three traditional nodes on this network -- composer, performer and audience -- you add two new ones: the "sound-giver" and the "instrument-builder". If I understand you, the topology of the resulting network is open, and any number of different pathways are possible. It is no longer necessarily a hierarchy organized in top-down fashion around a composer.

PL: I'm no longer so comfortable with this network model. There was an implicit assumption in my topology that technology was acting as an equalizer between people with different levels of skill. I think that's a slippery assumption. While I still think that the topology I described is interesting and suggestive, I've become a bit more skeptical about the hype that so often accompanies arguments about the freedom that technology brings to people who haven't undergone extensive musical training. There is a similar hype about "interactivity" -- that computers give you the ability to engage music and other things with a new freedom and flexibility. While it's true that a hypertext interface to a Beethoven symphony, for example, is an interesting thing to contemplate, so often the author of the links is imposing his or her vision on you, so in a way it's even less interactive.

I regard listening to a piece of music or reading a book as an intensely interactive activity, a communication between minds. I'm a little more hesitant these days about elevating the "sound giver" too much in that there are a lot of blurry boundaries between that node and the listener. I don't want to regard the "sound giver" as a node with equal weight to the performer or composer. "Instrument builder", however, is another matter. The design of an instrument will very often involve compositional decisions. To reduce it to a very simple-minded sense, it's as if I'm designing a piano which only plays C major chords, or which has a pedal that will always give you some particular resonance. So, the design process is actually like building an instrument that only plays a specific piece of music, and is perhaps synonymous with that piece.

Music on Tape and CD

JP: Recently I was listening to your piece *Still Time*, in which I feel I can hear the internal network-building process going on. The piece is very strong on the sound-giver aspects, but in certain places you're being quite definitely a composer. How would a piece such as this one be different if it were a piece of performed music, rather than one that creates a

special kind of environment and experience only possible to experience through a recorded medium?

PL: Let me back up a little and say that it's really a problem, writing music that essentially lives on tape or CD, because you're bypassing the whole performance process. My feeling about performance is that it creates a sense of danger and excitement in a piece of music. There is always a contest of some sort, and the piece and/or the performer is either going to win or lose. Early on in my work with computers, I noticed that pieces would often die on tape. Each time you'd listen to it something would be lost, so that ultimately it became meaningless blather. I didn't think about this at the time, but over the years, I suspect what I've tried to do is to come up with compositional strategies which ameliorate, and, I hope, eliminate this problem. One strategy is to build in a kind of distance so your relation with the music is oblique: it doesn't tell you right out what it is you're supposed to do with yourself as you listen to it. In the case of *Still Time*, I built an expansive and 'not-right-at-the-tip-of-your-nose' sort of continuity, which is modeled more on cinematic logic than on traditional notions of musical continuity. In other pieces, such as the *Chatter* pieces, the texture is so complicated that every time you listen to it, you can choose to pay attention to a different thread. In pieces like *Smalltalk* there is a similar difficulty in parsing the texture. You not only have to decide what to listen to, but you also have to strain to hear it. So, the mixing of natural and synthesized sounds in *Still Time* has more to do with the creation of an objective distance than anything else.

JP: Last year my four-year-old son went into a fun house at a carnival, and instead of going through it from start to finish, he found ways to loop back and do some things out of order, do some things more than once, bypass other things all together. He spent half an hour in there. He didn't see it as a left-to-right experience at all -- I think he took the name "Fun House" literally, and decided to live in there for a while.

PL: That's an appropriate model for some of the things I've been trying to do over the years. *Idle Chatter*, for example, was a very enlightening experience for me. I was very startled at first by the responses I got to it. Nobody seemed to hear the same things. Everyone seemed to choose a different route through the fun house. That sort of clued me into the idea that in order to make stuff survive on tape, there has to be a different kind of relation between the material and the way in which people engage it. In the *Chatter* pieces this has a lot to do with the complexity of the surface, of course. *Still Time*, on the other hand, is trying to cash in on our experience of film. This is in explicit distinction from what you might call a discursive model of music in which the composer leads you along purposefully and skillfully, often by the nose. While film can do this as well, it is also a medium which invites a kind of detached observation, and often allows you to ruminate on the moment. In terms of my revised network, I think that what I'm trying to do is to work up new ways of connecting to the listener, rather than opening possibilities with new nodes. But, I suppose that this is what every composer does.

JP: What about the compact disc as a medium? In your most recent releases, the CD as a whole seems more a single unit, the individual pieces more parts of the whole. Is Lansky reinventing the concept album?

PL: I really think the CD is a great medium because it's like a book -- it's not just a repository. There was an implicit assumption in the days of the LP that the LP was kind of an archival medium. For a variety of reasons, such as its durability and fidelity, as well as the ease with which you can maneuver around in it, I think that the CD medium itself is opening up new musical possibilities. I do like to think of individual CDs in terms which will differentiate one from another. It's not always possible, but when you do have a group of pieces which go together well, it seems appropriate to group them together in a "concept album." It makes it like a book, or a movie. I like to think of a CD more like a book or a video than like a "concert in a box."

Musique Vérité

JP: There were some composers in the '70s and early '80s doing what I think of as the electronic-music equivalent of *cinéma vérité*, for instance Luc Ferrari in *Presque rien no. 1*, where he records a day at the beach and mixes it down to album length, and Fritz Weiland's *Orient Express* [1982], ninety minutes of unprocessed train sounds. Such pieces really are almost documentary journalism, almost pure sound-giver.

PL: I think that these pieces are extremely interesting and suggestive. They do tend to suggest, however, a Cage-like dialectic in which you presume that what we traditionally call music is a rung on a ladder leading to a world view in which everything is music. My point of view inverts this, in that I feel that what is particularly interesting about music is the way in which it can build worlds on its own. My perspective is that rather than trying to liberate our musical perceptions from traditional notions of music, I'm interested in harnessing the world-building power of familiar musical conceptions to enhance our perceptions of the sounds of the world. Often, I take the sounds of the world and impose 'music' on them, or use them as excitation functions for music. In *Small Talk*, for example, I simply use speech to trigger musical filters, and so the speech itself becomes a much more traditional kind of music. I would hope that what happens is that it feeds back so that you can hear speech as musical. I guess I'm thinking of music as the top rung of the ladder.

There is also an implicit association that these pieces make between sound and sight -- if you can create a work of art by photographing a scene, why can't you do the same by recording it. I think there's an interesting distinction between photographic images of things in the world and recordings of world sounds, however. Photographs and film lose a lot in that they are in two dimensions and in a limited frame. I heard Martin Scorsese make an interesting observation that film presents the perspective of an unblinking eye, focused on one point. In the real world we are constantly turning our heads, blinking our eyes, focusing on different things, etc. Recorded sound, on the other hand, has the potential to completely recreate the sonic experience, to the limits of the reproduction equipment, which is improving all the time.

My feeling is that to the extent that we realize that it's a recording, we don't engage the kinds of sensory hooks that we do when we hear the sounds live. There are two ways you

could look at this. One is that recording is creating an artificial frame which allows us to listen to the sounds with a different kind of appreciation, and this is what Luc Ferrari and others are cashing in on. The other point of view, which I think I believe, is that when sound is stripped of its physical sources and environment, that we lose what I like to think of as a sense of danger. Lacking this kind of presence, the recorded sound ultimately loses its power. There is also an interesting analogy with Scorcese's observation. When we hear sounds in the real world we are constantly turning our head and focusing our ears on one thing or another. Recorded sound, like film, eliminates the need to do this. In the real world we need to know where the sound is coming from, and how to locate it in the environment. This can be a life and death issue, or just a matter of curiosity, but we localize automatically. So, a recording may be fun for the first listening or two, but after a while it becomes boring. This is where music comes in. I feel that music's world-building power allows one to restore the sense of danger in the world sound. It's as if we are creating a theater for the sounds and using the power of music to make them permanently threatening.

When we enlist 'music' in this enterprise, we're creating a situation where the listener suspends disbelief -- you're investing in the theatrical experience. That's what's so wonderful about opera -- and cinema, in a sense, does the same thing -- you recreate the danger of the real experience. That's what I tried to do in my piece *Night Traffic*, made from the sounds of the cars whizzing back and forth. At first I found the recorded sounds exciting by themselves but eventually they became kind of ugly and meaningless, so what I felt I had to do was to impose a musical context which puts one in a more theatrical relation to the traffic sounds. As a listener, then, when you hear that truck rumbling by, accompanied by a monster E flat chord that's getting louder and louder, distorting as it goes, you engage a different kind of relation with sound, and it remains terrifying, or perhaps becomes terrifying in a theatrical sense. (One of my friends described the piece as "*Tod und Verklärung* on Wheels"). But at least this allows me to experience some sort of danger on repeated hearing. I suspect that what I'm suggesting is closer to traditional notions of program music than to what Luc Ferrari and others are doing.

Electronic Music: Getting Hooked

JP: Did any of the relatively few durable milestones of the early electronic (or pre-digital) era, for instance Varèse's *Poème électronique*, Stockhausen's *Gesang der Jünglinge*, or Berio's *Thema (Omaggio a Joyce)* steer you in the direction of electronic music?

PL: I was not one of those people who heard early electronic pieces and became convinced that this was the way to go. I have a lot of respect and admiration for those who forged the way, but they weren't what convinced me to give it a try. In fact when I first came to Princeton the graduate representative, Ken Levy, had to twist my arm to enroll in Godfrey Winham's course. The things I subsequently found most exciting about it, and still do, have to do with the musical economics of being your own performer (as a French Horn player my options were very limited...)

I found then, and still find now, wild electronic effects to be rather uninteresting. What is

more interesting to me are the pieces which make new suggestions about how music might go. (I still love Milton Babbitt's saying: "No sound grows old faster than a new sound.") In this respect, one piece that really knocked me out much more than any of those pieces you mention was Jim Randall's film score for the movie *Eakins*. It basically consists of a lot of rather simple, sustained synthetic tones. But, when I first heard it I was bowled over by the way in which its musical elegance was so powerfully expressed by the capabilities of the machine. For me, this was much more suggestive than the well-known blockbusters. By their standards it was probably primitive and simple minded, but by my standards it opened a new world. It had a lot of influence on my first computer piece, *Mild und Leise*.

Ends And Means

JP: In the 1983 interview you did with Curtis Roads, you said, "It would be nice in the future if the description of the piece's hardware and software resources became as relevant as an assertion that a pianist played on a Baldwin or a Steinway". Do you still feel this way?

PL: If a piece elicits more curiosity about its production methods than about its content it is essentially a failure. I don't want people to listen to my music as an example of the power of technology. I would prefer that they didn't even notice. There is a lot of commercial music which uses very powerful signal processing, but people are generally not enthralled by that. If the technology shouts louder than the music, it's over. I think we won't really get anywhere until the technology becomes utterly uninteresting. When you listen to beautiful violin playing you do sometimes marvel that the human race invented this incredible instrument, but usually you notice the music. Vacuous virtuoso pieces are on the other side of the same coin. The music doesn't really matter, it's the technique. Unfortunately, a lot of computer music today is motivated by the pressure to show off the technology, to demonstrate technique.

The Computer and Notation

JP: One of the things that stopped me cold at first about working with your programs on the IBM mainframe many years ago was the absence of anything resembling either musical notation or musical input devices. Ultimately, though, it was very exciting to be freed from the grid imposed on one's musical thought by traditional music notation, and by the black and white keys of the piano keyboard. The cliché about sculpting directly with sounds repeatedly came to my mind back then, on those days when everything was going well.

PL: I have become increasingly aware of the conceptual prison created by notation, particularly in computer music. There are lots of different kinds of music which have little or no tradition of notation, and there are a vast variety of ways in which music relates to its notated form. On the computer, which is the ultimate instrument, after all, it seems a bit absurd to think in terms of traditional Western notation. This raises an interesting question, however, which concerns compositional methods in general. I think

that there are two kinds of composers, to be a bit simplistic: those whose music originates in the notation, and those for whom notation is, at best, an attempt to capture something. When I look at scores by my colleague Steve Mackey, for example, I am struck by the fact that nobody could possibly invent music like this on the page. He is being very ingenious about finding ways to notate his conceptions, and essentially he's battling with notation. My experience with computer music is that notation is more like a diary, or mnemonic, or place holder. In addition, you generate megabytes of data files which can tell you everything about the music, down to the sample. Almost inevitably, when I begin a computer piece by writing some notes down on music staves, it ends in failure. It's lots of fun to look at the role of notation in popular culture. Commercial transcriptions of music by Pearl Jam, for example, consist of extraordinarily fastidious notations which give it the appearance of something quite complex, alongside guitar tablature.

JP: All this being so, I can see why you have said publicly that you don't like MIDI very much.

PL: While MIDI is tremendously useful for many things, and has revolutionized the music industry, its conceptual limitations are severe. It is a protocol based on a view of music in which the notated score is at the top of the hierarchy, rather than somewhere off to the side, where it belongs. I find it extremely limiting to work with, particularly because of the ways in which it detaches pitch from timbre, from rhythm, from expression. So much of what I find interesting about doing computer music has to do with musically realizing the potential of some acoustic event. In the limited work I've done with using synthesizers as sound generators (for instance, a piece called *TalkShow*) I found it very frustrating to invert the process and poke around some odd synthesizer for an appropriate timbre after I had written the piece (which was actually a piece of interactive software.) I really hope that something better and more intelligent, and faster, than MIDI comes along. I expect it will.

The Ivory Tower

JP: The condition of the academic composer is the subject of much discussion. There are, for example, John Harbison's "Six Tanglewood Talks", Frank Zappa's infamous tirade to the composers of ASUC, and some less than complimentary words from Morton Feldman about the Princeton music department of old. Do you think about the oft-lamented quandary of the university composer very much? It seems to me that you're pretty much exactly where you want and need to be.

PL: I think the university is great. I see its problems very clearly, and I see its limitations. I see what you need to protect yourself from. I see the pressures it puts on people. Despite all these factors it enables things to happen, good things, which could never happen otherwise. If I had not been at a university all these years I would never have been able to do anything remotely like what I've accomplished. Computer music is entirely a product of universities. Frank Zappa certainly would never have been able to do a lot of his work if Jon Appleton and others around Dartmouth hadn't had the freedom to work on the Synclavier, and John Chowning, at Stanford, hadn't discovered the musical potential of

frequency modulation. Bell Labs gave it the initial push, and Yamaha made some big bucks, but without all the work that went on at universities, the field simply wouldn't exist.

On the other hand, I feel that people who are involved in the arts in the university have a real responsibility to be aware of how the world at large perceives their efforts. It's very easy to lose touch, particularly in matters involving technology. Every once in a while I like to hop down to the local music store to see what's up. Music stores and guitar stores are incredible places, worlds of their own.

I suppose that universities are just like anything else in the sense that if you know how to work around their problems, you can really appreciate their virtues. Working at a healthy university with good students is an incredible luxury and privilege. Don't think that I don't appreciate it. I certainly don't take it for granted.

JP: Do you think things are changing? I know that a lot of university composers feel endangered right now.

PL: I think that there are a couple of things that have been happening. Federal cutbacks in research support for the sciences is ultimately going to bounce back to the humanities, because the sciences do support the humanities. The new retirement law is a real disaster. I recently read an article by Hillary Clinton in which she quoted John Adams (the president), who said something to the effect that "I have to study war so that my children can study math and science and philosophy, so that their children can study art, literature and music." The basic assumption at a university is that everything is valuable and everything is interesting: biology, math, music (although people in the humanities realize that they do not quite have the clout of those in the sciences).

JP: That requires a very long view.

PL: It's a position you have to constantly reiterate. University musicians have to be very careful not to succumb to physics envy. Our position has to be that nothing is as interesting as music, and that we need not justify it in any way other than asserting that knowing music is part of being human.

Eavesdropping, Speech and Song

JP: There is something hopeful about your preoccupation with the sounds of human speech and human activity. This despite what you've said elsewhere about computer music being "a domain prone to great seriousness, sometimes bordering on despair."

PL: I was being partly sarcastic. So what was your question?

JP: I'm trying to get at the role of speech in your music. You've mentioned that you're out of sympathy with text setting or songwriting, as it's conventionally done -- that's not what you like to do with speech, setting speech to music.

PL: I would prefer to say it's not what I'm particularly good at. I wrote the *Six Fantasies on a Poem of Thomas Campion* because I really wanted to see what it would be like if I tried to write a song, and that was my way of writing a song. I just can't see myself writing songs.

JP: One of the things that everyone notices about the Campion *Fantasies* is the way that you coax the musicality out of the spoken word -- there's an appealing gentleness and respect for the recitation, for the sonnet.

PL: I would hope at the end of the piece that speech will sound like song. It has kind of a didactic function, to make you listen to the music in speech, or to explicate the implicit music in speech.

JP: The listener sits back at the end of the Campion piece and says, wow, all of those amazing sounds were hidden in the text all along! It's a bit of legerdemain on your part, because you are imposing things on the text, although it doesn't sound that way.

PL: I'm really interested in the inner voices of simple things. In a way, my ultimate interest is to make simple things seem more interesting and complicated rather than to make complicated things seem simpler. In *Smalltalk*, for instance, I want to make music from the rhythm, contours and feel of the conversation -- to make you notice that there's kind of an inner text in the conversation. What people are saying is sometimes not as important as how they're saying it.

The *Idle Chatter* Pieces

JP: I want to talk about the *Idle Chatter* series. I remember you saying when you did the first piece that one of the things that inspired you to do *Idle Chatter* was the way the New Jersey Percussion Quartet moved, changing mallets constantly, moving from vibraphone to drums to glockenspiel, constantly in motion, in a sort of logistical counterpoint to what they played. What do you think now?

PL: I remember the concert, now that you mention it. I was quite attracted to the busy workshop-like atmosphere. It really generated a feeling of multi-tasking, and seemed to be quite suggestive for a computer piece. Another inspiration for the piece was rap music, which had just emerged from hip-hop, and sounded really interesting and outrageous. *Idle Chatter* was also a break-through for me in that it was the first piece of mine that was specifically tonal.

Just as *Idle Chatter* was inspired by rap, *just_more_idle_chatter* attempts to conjure up a lively group of background singers, all holding microphones and swaying from side to side, accompanying the main singers. In *Notjustmoreidlechatter*, I'm not sure what was going on, but I sure did indulge myself in writing fourth species counterpoint.

JP: And you mentioned someplace that you could almost understand what's going on at certain points, that there's almost a linguistic *dénouement*...

PL: Somebody described it as a piece which seems to consist of a bunch of monkeys chattering away, and at a certain point they almost begin to make sense, but return abruptly to unintelligibility, as reality is regained.

JP: In these pieces, instead of the usual Lanskyian eavesdropping on a more or less complete recitation or a continuous discourse, you're taking a slice of someone else's speech, and building something from the ground up with it. And in these pieces aren't you doing a lot with filtering, creating banks of formant filters...

PL: On those pieces? Those are very simple, actually. They're done with Linear Predictive Coding, which does amount to rapidly changing banks of formant filters. I just isolate words, sort of flatten the pitch contours a bit, and then transpose them. The sustained stuff is done with granular synthesis. And then the bulk of the detail work is done with a kind of algorithmic composition. I don't actually decide what note goes where, I use a random probability method that scatters them with a fair degree of consistency. That works pretty well -- I do it a lot.

Perle Jam: Implication and Reference

JP: In your recent Perle article you talk about implication and reference, which suggest a very powerful way of examining what we mean when we say certain things about music.

Let me quote you here:

Implication refers to the ability which a note, chord, passage, or some pitch/rhythm configuration has to imply some other notes, chords, etc., either consequently, simultaneously, or previously. Familiar examples of this are suspensions, resolutions, progressions, sequences, voice-leading rules, cadential patterns, motivic connections, etc. Whether or not the consequences of implications are realized is not important -- the absence of realization is often just as significant...By reference I mean the listener's ability to relate a note, chord, passage, etc. to a more abstract concept, such as a collection of pitches, or pitch-classes. The concepts of "key", "scale", and "collection" are familiar forms of reference.

Your implication/reference dichotomy is a way of making interpretive and editorial decisions, as well as a means of analysis: you use it to explore the E versus E flat issue in the third measure of Chopin's Prelude Op. 28 No. 20, to talk about Perle's music, Stravinsky's *Serenade in A*, and the blues. It seems to me that it's very hard to carry the concept of implication out of the realm of pitch-centered music.

PL: I think I'm able to extrapolate out of the pitch domain into recordings of real-world sounds. My sense of the implicative qualities of recordings of real-world sound, is that

they entail a powerful sense of implication that is closely related to a sense of danger, as I mentioned. Our perception of sound in the real world is often used to tell us what is about to happen. We read the future by the sounds of the present. What I think I've been attempting to do is to use the power of music to enhance the implicative qualities of real-world sound. For example, I take the sound of cars passing, or the sound of wind in the garden -- sounds which have no implicative qualities in terms of pitch -- and somehow impose musically based implicative qualities. In my speech pieces I think that the same thing happens but in a slightly different sense. An interesting example is *Now and Then*. It consists of phrases from children's stories that have to do with time. The text implies a lot but is never explicit about content. The listener has to reconstruct the story inwardly. My sense of the implicative qualities of real-world sounds (particularly since I'm dealing with them as sound on tape) has to do a lot with what you actually end up doing in order to make the sounds on tape have as much power as they have in real life, or perhaps even more power. To be really convoluted about it, you might say that music gives you the power to suspend disbelief in a case in which belief has become inherently weak (i.e. you no longer really can absorb those recorded sounds as real sounds).

JP: So a timbre- or spectrum-oriented sound world can contain implication?

PL: Yes, absolutely.

JP: And that would be the case to the extent that there is a human presence in that sound world, footsteps...

PL: Yes, but once you've heard the recording of footsteps several times you no longer have the same response -- like a cat looking in a mirror.

JP: Let's get back to George Perle. He was a teacher of yours at Queens. What was your contribution to his book on serial music?

PL: What actually happened was that he published *Serial Composition and Atonality* while I was a student at Queens. There was a confusing chapter about his so-called twelve-tone modal system. George didn't feel that it was proper for him to talk about his own music. But, he was an inspiring teacher and I took it on faith that there was something substantial going on there, even though he was hesitant to go into it. After I graduated from Queens and came to Princeton, I decided I would try to do something with his twelve-tone modal system, and in '69 I wrote a piece using it and then wrote to George to tell him about some new twists I had used -- I combined two primes -- and assumed that he would be horrified. Instead he wrote back saying, "My God, in thirty years I've never thought of doing that." So we started a huge correspondence, and worked together very closely for about three years, constantly expanding the system. I basically see it as a multi-dimensional system of cyclic arrays. George sees it in a much more complicated and rich way. I wrote my dissertation on it, and I developed a mathematical model of the thing using linear algebra, which sort of had the effect of making me lose interest in it, to the extent that all the mystery was gone. George, on the other hand, is

working with it more intensely than ever. He's just published the second edition of "Twelve-Tone Tonality".

JP: You mentioned somewhere that one of the things you thought you wanted to do with the computer early on was explore serial relationships with it. A lot of people seemed to have that idea in the '60s.

PL: That was a big thing back in those days. Milton Babbitt had a set of tapes which he played to demonstrate that you could hear things which were, however, very difficult to perform. The idea was that a really powerful use of the computer was to do a lot of things that would be easy to do on the machine and would be really hard to do in real life, but which would, however, make perfectly clear aural sense. That was the first reason I went to the computer in '66 when I first came to Princeton. My first computer piece used combinatorial tetrachords. I had the spectrum of each tetrachord tuned in major thirds, which are excluded in a combinatorial tetrachord, with the result that the timbre would always uniquely define the tetrachord. I worked on it for about a year and a half and finally trashed it. I very quickly moved to use the computer as an aural camera on the sounds of the world. Coming from an orientation in which pitch and pitch class played a central role, this led me to what I consider an interesting issue, namely the different meanings of pitch in computer music and instrumental music.

I feel that in instrumental pieces, as in the piece I just played for you [*HOP* for violin and marimba], that pitch really functions as a predicate -- you're constantly tinkering with pitches and doing things with them in an interesting way that defines the logic of the piece. This doesn't work the same way in computer music. On the other hand, while some people certainly turn to the computer to create a sonic landscape in which pitch is vaguely defined, I seem to still want to make pitch an active player. But I seem to use it in a way which allows other aspects of the piece to become focal, while still functioning in a way which engenders implicative qualities.

JP: Pitch is sort of a carrier wave?

PL: Perhaps, and then the information is decoded by demodulating that package rather than letting the pitch itself lead you along. So, for example, when I started to do *Idle Chatter*, I was still doing the Perle-type stuff, and the way I got to B flat major in that piece was by just simplifying my cyclic arrays until all of a sudden I was just sustaining an F for a long time, and then I added a D, and then a B flat, and that seemed to be all I needed. So I really backed into tonal music. I didn't decide that I was going to write using tonal syntax. I still don't think of it that way as much as letting the pitch contours and context occupy a certain relatively uncomplicated niche. It often seems to me as if telling complicated pitch stories is something that performers do so well, while machines have other capabilities, to create worlds and landscapes which have very different agendas.

JP: I heard a North African drum ensemble once where the drumming was in the foreground and a flute was accompanying the drummers.

PL: Perhaps that's the way I'm thinking. I may be deceiving myself, because it occurs to me that one thing I may be doing is investing very heavily in a lot of musical experience that people have, so using triads and tonal content is not necessarily simplifying things in that sense.

JP: It suggests to me that at one point you had a real love of system.

PL: That was the way things were back in the 60s, and even the 70s to a certain extent, especially around Princeton. It was very exciting. In recent years, however, I've come to think of the whole "system thing" as a particular kind of mythology. Everything is a system, and nothing is a system.

JP: Your article on Perle suggests to me that no matter how far afield you've moved from serialism and high-tech musical modernism, all along you've been thinking about the sorts of issues that Joseph Straus deals with in his book *Remaking the Past* --namely, finding commonalities in the ways we can talk about very different dialects within the twentieth century musical repertoire, and what they have in common with earlier music. Finding a common vocabulary to deal with these different kinds of music seems to have been occupying you under the surface for quite a while.

PL: Yes, a big issue for me, which I tried to get at in the Perle article, was that I think we've developed bad thinking habits concerning the distinctions between what we think of as "tonality" and whatever followed it. In general, I consider the traditional practice of regarding some music as tonal or not tonal to be very simplistic and probably due to our reliance on the machinery of music theory. I was really interested in this notion that a lot of what music does is to tell you where you are and where you're going. Different kinds of music have different ways of expressing implication and reference, but nevertheless you see them in all kinds of music.

In the blues, for example, there is a fascinating friction between our ability to comfortably locate ourselves at any moment in a familiar pattern, and our anticipation of the next step as a result of our clear view of where we are in the big picture. In a sense, you are flipping back and forth between a referential and an implicative perspective. I suspect the blues is more like Vivaldi than Brahms in this respect. A leading tone, for example, derives its qualities from our referential perception of it as the seventh degree of the scale, while at the same time implying a resolution. The two concepts then coexist and add dimensionality to the experience. Twelve-tone music seems to me to invest much more heavily in reference than implication, and for this reason I am disappointed at the lack of friction, or interaction, between the two.

Loudspeakers: Windows Or Instruments?

JP: You mentioned that you used granular synthesis in the *Idle Chatter* pieces. The granular synthesis essay *par excellence* is Barry Truax's *Riverrun*. That piece is one that

people unfamiliar with contemporary music have trouble acknowledging as music, because, like a river, it doesn't breathe.

PL: In a way, the issue seems to me to be more one of acknowledging loudspeaker music as music. Some people, like Miller Puckette in a CMJ article a few years ago, are quite explicit in denying it this status. The interesting question in this regard is whether you consider loudspeakers to be windows or instruments. Most people are accustomed to thinking of them as windows in that they usually listen to recordings of a live event, and the loudspeakers attempt to approximate something of the acoustics of the original sound location. I suspect Truax, Xenakis and others would rather regard them as instruments. In my case, however, I prefer to regard them as being windows into a (you'll pardon the expression) virtual reality that the computer creates. In pieces like *just_more_idle_chatter*, I want to create the illusion that there is a virtual band of girl singers in the background, and in *Still Time* the illusion that there is somebody back there actually doing something, and also that the space of the speakers is being subtly manipulated by a larger cinematic presence. In these cases, however, the virtual reality is probably somewhat unfamiliar and the listener has to do some work to parse the space. I regard this as one of the real potentials of computer music, the ability to create worlds which need to be fleshed out by the listener. When you have a recording of somebody speaking or of somebody playing an instrument, you have a pretty good mental model of what it is, but when it's not quite clear what's going on, the listener has to do a lot of work. That's why, for example, a lot of the early reaction to electronic music was that it was "outer space music". People were trying to find some physical correlate of the sound. They were trying to find some way in which they could imagine the sound's origin, and the most likely scenario was outer space, because it seemed to have no earthly source. But they were doing interesting things with their heads as they derived this scenario. I think that the real power of the medium is to create a world in which the listener has to work to imagine what's going on. The listener becomes his or her own story-teller, in a way. What I find the computer so good at is manipulating all kinds of familiar sounds to stimulate our consciousness in an endless variety of ways.

The Audience And Computer Music

JP: Computer music seems to be a medium that targets itself very specifically to the individual, to an audience of one listener at a time. There doesn't seem to be much of a role for the mass audience now, all sitting together in one place and listening to your music en masse. It's best experienced in your own armchair, through your own speakers or headphones.

PL: It's great fun to listen to music with other people, on the other hand one thing I've become sensitive to is the way in which a given piece programs its listening environment. To take a really simple example think of the ending of Brahms' Second Symphony, where there are series of big chords while the horns hold a sustained D major triad. At that moment you actually hear the audience exploding with applause, or perhaps anticipating a huge ovation. Brahms really mastered the large concert hall. There are some electro-acoustic composers -- several Canadians and Swedes come to mind -- who seem to be

working in the same environment. They write pieces for dozens of large speakers in a large space and attempt to create a sensational effect for a large audience -- and they do. Some of my pieces fall absolutely flat in a large public space -- *Memory Pages* in particular -- in that they are very private and intimate pieces, while others, such as *Still Time* seem to work better.

One thing that I discussed in the *Soundout* interview was that shibboleth about how hard it is to put on concerts of tape music because people have nothing to look at. The more significant problem is that there is no intermediary between the listener and the composer. In this situation you essentially have the composer screaming in your ear -- and there's no escape. You're just much too close to the composer: you smell his breath, etc.

This is an interesting problem, because one of the things I like to think about in tape music are ways to give the listener a chance to maneuver, or, as I mentioned earlier, a kind of objective distance. Perhaps it's a lesson from minimalism that it's interesting to relinquish control for a while and let the listener wander about, perhaps changing levels of focus and concentration. When you have a piece for live performers, you don't quite have that problem because they essentially provide an alternative point of focus. I suspect that this hasn't really dawned on a lot of people who do electronic music. They still use the conceptual model of the performer, and they don't realize that they're essentially shouting in somebody's ear.

Found Objects and Filters

JP: In many of your tape pieces, you tend to respect the internal chronology of your chosen sound source, and use filtration techniques to process the source as a whole. Filtration seems to be important to you, to have an almost metaphorical value.

PL: I spend all day, every day, working with filters, and that's essentially what it's all about, so I think of filters metaphorically in that any time you experience something, you're experiencing it through a filter, whether it's the filter of your own experience, or whatever...

JP: Although early electronic music developed around additive synthesis.

PL: Well, I think it was just that we hadn't caught up the engineers yet, and in the early days it was much more expensive to use a 64th-order filter than a simple lookup-table.

JP: That brings me to another point. A fairly early work of yours, *Crossworks*, is sort of indicative to me of where you were headed because you're already taking a musical found object and coaxing some latencies out of it, the way that you were to do a little while later in the *Campion Fantasies* and some of your other tape pieces. With *Crossworks*, of course, you make use of a musical object laden with such baggage and freight, it almost seems to me that you're trying to exorcise some demons.

PL: I think a particular demon I'm talking to there is the incredible ability a good piece of

music has to invest one moment with the resonance of the entire piece. The opening chord of Schoenberg's Op. 16 No. 2, for example, just rings with the sound of the entire movement, as does the opening chord of Beethoven's Op. 110, etc. I took a specific challenge in *Crossworks*, to liberate that chord from Schoenberg. It's such a great chord and I resented the extent to which he came to own it... But of course the reason it's such a great chord, is because of what Schoenberg did with it. (I'm stuck in a circle here.)

JP: It's interesting to hear you say this, because I always assumed from hearing all the work you've done with human speech that you really wanted in some way to free yourself of even-tempered tuning.

PL: I think that as much as I try to escape it, I've got an equal-tempered grid in my subconscious. I've denied it for years, and I still do, but I think that it's fundamentally where I end up, no matter how hard I try to escape -- and I do try to escape. I do believe that there's a lot a mythology about it, that there's not really any such thing as a true equal-tempered system, because the only machine that can ever really do it is the computer, and then when you do it on the computer, it's always really awful. I find myself constantly detuning things on the computer. A curious by-product of working with a digital system is the integer loop length problem. Comb filters, for example, are inherently out of tune because their memory is in an integer-length loop and their resonant frequencies are thus equal to the sampling rate divided by the size of the loop. The higher you go the worse it gets. You can fine tune them with all pass filters, but it never seems to work quite right.

Saying Things With A Computer

JP: "Expression" is a term eschewed by many composers in this century. Does it punch any buttons for you? Is your music expressive, or anti-expressive, or does musical expression not involve you as a composer?

PL: I see the sense in which it's a pejorative term --to the extent that it's synonymous with "effusive". But the way in which a piece of music tries to make a point, if you use the term "expressive" in that sense, it's certainly something I'm interested in. I can think of some peoples' pieces which one would not regard as expressive because of the extent to which they're asserting their own idiosyncrasies without too much concern about what one makes of them. Perhaps this has something to do with the ways in which a piece negotiates its terms with the listeners. Some pieces are like those buses in New York City that bow down to politely let passengers off and on, while others are moving trains which barely stop, and force you to leap on and off at your own risk. I definitely think of my pieces in the former category, although I love a lot of pieces in the latter.

JP: In fact, I'd go so far as to say that most people would find remarkable the extent to which your music is expressive, in that it is electronic music.

PL: Without meaning to seem arrogant I'd like to say that a lot of people doing electronic music are attracted to it by the advertisement that says that it's going to make it easier for

you to do dazzling things. In fact, I regard the medium as one which makes it hard to do anything, and I consider it more like a musical instrument which you have to learn how to play, slowly and with great patience. There is a wonderful moment in learning to play an instrument, when after years of practice you suddenly get some positive feedback. At that point, the process accelerates as you and the instrument start to really hit it off. One of the problems with electronic music is that very early on, anybody can get stuff out which is going to sound sort of like music, but it is essentially not feedback, but rather communication between you and the software designer (this is why I think people should write their own software). You are not getting your own head and heart into the act. The real threat to computer music is in the extent to which it's deceptively easy. Technology is moving so fast that musicians are discouraged from spending the time really learning to master an instrument. The pressures come from several sources: in the commercial music industry, new products with very different characteristics are constantly being offered while older technologies are made obsolete -- in the research/academic community, the pressure is there which encourages one to demonstrate the superiority of your latest software or hardware. The IRCAM ISPW, for example, was not around long enough for most people to do more than demonstrate its signal processing power, and if you were entrusted with one, the implicit understanding was that this was your main responsibility.

JP: "What have you done with our grant money?"

PL: The other thing I'm feeling concerned about these days is that I'm noticing more and more that it's really important to make a lot of music while you're growing up, play an instrument and make sounds. There is certainly no shortcut in learning to play tennis, for example. You have to get out on the courts and spend a lot of time hitting the ball into the net. Music is no different.