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Roger B. Dannenberg

Introduction

I am honored to be invited to give this address. I have been involved in computer music for over 20 years now, and although I have had many excursions into other fields, I feel most at home working on computer music technology and creating music with computers. The International Computer Music Conferences (ICMC) and the International Computer Music Association (ICMA) have therefore been very important to my career and my sense of direction. The most important part of these organizations is the people involved, and I would like to talk about these people, about us, as a community. This document is not a literal transcript of my keynote address, but rather an approximate recreation. I welcome any comments you may have.

I really want to address two topics. The first is about the nature of our community, how it functions, and what it might be doing differently. My thesis is that the Internet can make a big difference in the way a small global community operates, so we should think about the implications of new technology, not just for computer music but for the computer music community. If the first topic is about how we might do things, the second topic is what we might be doing. I will describe a personal selection of favorite research challenges that I hope to be working on for the next decade, and perhaps I can interest some others in joining me.

Before jumping into these topics, I thought it might be appropriate to talk a bit about "the good old days" of computer music, how I got started, and how things have changed in the last couple of decades.

Computer Music Then and Now

I started studying computer music in the late seventies, mainly by reading everything I could get my hands on. The first ICMC I attended was in 1983, twenty years ago, at the Eastman School of Music. One of the talks was about ultrasonic sensors for conducting, and my immediate impression was that it would make more sense to follow human musicians than conductors. (At least in my experience playing in orchestras, that's what I learned to do!) So I set about creating what I called "computer accompaniment." To test and demonstrate my ideas, I designed and built a small computer that included hardware support for pitch tracking and sound synthesis (see Figure 1). This work was presented at the 1984 ICMC in Paris. In the figure, you can see the luggage handle I attached to the box to make it easier to carry, and the whole system was designed to fit under an airplane seat to avoid damage.

Figure 1. A small computer built by the author to develop his first computer accompaniment system.

This illustrates what research was like then. There was a lot of focus on hardware because computers were just too slow to do many of the things we wanted to do. By 1980, there were a number of synthesis languages running on mainframe and minicomputers, but microprocessors were the new thing, and the area of real-time synthesis and control was full of possibilities. Computers and software were relatively simple, making it possible to build or modify systems without a large investment of time and money. Hardware promised to make things fast enough for real-time synthesis, so a lot of effort went into creating systems and not so much work went into exploring what these systems could actually do.

Hardware versus Software

Most hardware design efforts by researchers were not great successes. Figure 2 illustrates why. Suppose you started building hardware that you expected to be 10 times faster than a software approach. (Theoretically, hardware could give much better than a factor of ten speedup, but in reality, we are matching state-of-the-art processors against home-brew hardware.) Whatever the speedup of the hardware, notice that the software approach is going to get exponentially faster over time due to Moore's law: processors are going to double in power every 18 months. So by the time the hardware is designed, built, debugged, and supported by a suite of software, it is lucky to have a useful life of a year or two before it gets overtaken by software running on the latest, greatest microprocessor.
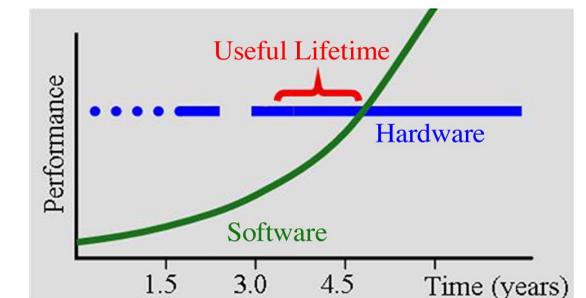

Figure 2. Software always overtakes hardware at an exponential rate.

Tools in the Early Days

Unlike today, when there are so many computer music products on the market, experimenters in the early 80's had to either build their own systems or adopt one of the few systems that worked. As a result, there was a lot of do-it-yourself work, including drivers, interfaces, and synthesizers. People tended to gather around and support systems that worked, because there were relatively few choices. Also, there was a small separation between tool builders and tool users. If you wanted the tools, you pretty much had to be proficient in building or maintaining them. On the other hand, systems were much simpler than typical computer systems today. One could build hardware at the gate level, interface it to a computer, and write instructions that would directly read or write to the hardware. Today, there are many layers of abstraction in both hardware and software, so building or customizing systems is much more difficult.

Tools Today

Of course, a lot of the work we did twenty years ago is no longer necessary. Every personal computer has audio I/O built-in, complete with software. The speed at which computers are progressing has led to rapid software evolution, and there are many different interfaces supporting sound on computers. For example, WinMM, DirectX (versions 1 through 9),

and ASIO all provide software support for sound I/O under Windows. Instead of too few things that work, we are cursed with too many choices. Another change is that today's computers are generally less suitable for real-time control. Even though they are much faster, the layers of software and hardware abstraction create a lot of overhead. The 4 MHz microprocessor in Figure 1 handled interrupts faster than modern programs running at clock rates a thousand times faster. Of course, the modern program is protected and scheduled by an operating system, so it may take a thousand times more work to transfer input data to the program, but that's exactly my point. Earlier computers were simpler in many ways.

Commercial vs. Research Systems

One thing that has remained true is that computer systems become obsolete quickly as newer, faster systems replace them. However, since today's systems are so much more complicated, it is especially hard to keep up-to-date. This is not such a problem for commercial systems, where upgrade costs are amortized over many customers, but for researchers and special-purpose systems, system complexity often kills off new developments. For that reason, we are more dependent on commercial systems such as audio interfaces, synthesizers, and even the software that drives them. This puts more separation be-

tween the tool builders and the tool users than in the past.

Commercial systems are a mixed blessing. We benefit from commodity products like fast processor chips, CD recorders, digital audio interfaces, and laptop computers. The music industry also builds synthesizers, controllers, and software that are invaluable for research. On the other hand, we suffer from poor design and rapid turnover. Commercial systems make many assumptions that are simply wrong for our admittedly small community of researchers. (Note that by "researchers" I include scientists, engineers, and composers.) Due to these assumptions,

- most off-the-shelf systems do not support interaction and live performance,

- we are often limited by conventional media formats, e.g. DAT recorders and CD's are limited to two channels,

- systems change rapidly on the assumptions that users have not built their own extensions and modifications, so replacement is simple,

- making software obsolete is good for the industry--it reduces maintenance costs and increases sales.

The Computer Music Community

In my opinion, the community of computer music researchers suffers more than necessary. We tend to build tools for personal use or for a very narrow distribution when we have to, and otherwise rely on the mass market to generate products that we can use. Between these two extremes of personal and mass market development, I believe we should spend more effort at the level of the community, pooling our limited resources to everyone's benefit.

One would expect that in an active community like ours, there would be some well-developed resources, including:

- standard portable libraries for audio I/O, MIDI I/O, sound file I/O, unit generators and common DSP functions, and digital audio compression,

- editors for audio, events, and music notation, allowing annotation, display, visualization, and composition,

- collaboration on network-based music performance, including theory, practice, tools, servers, and codecs,

- benchmarks and datasets for analysis/synthesis, DSP performance, pitch estimation, music transcription, and other tasks,

- curriculum design: what are the core concepts to understand, and what

are the great works everyone should hear?

What can we do to achieve these and other goals? I believe that people generally make rational decisions, so it must be that there is simply not enough reward to justify community-oriented effort. However, we need to realize that this is *our* community. Collectively, we establish the norms and in many ways the reward system. We teach those that follow us, we review proposals and papers, and publish a large fraction of our own work through the ICMC proceedings. Our members are on editorial boards of most of the publishers that are important to us. I think we can change things if we want to, and this might be a very rational decision.

The Internet

How can we change things? One strategy that seems obvious is to leverage the Internet as a repository of the shared community. Email and web sites offer 24-by-7 access to information across the globe. Open source software is a good model of community cooperation. Facilities like Source-Forge and CVS support global software development teams quite effectively, enabling cooperation that never would have worked in the past.

The Internet has already defined the way many of us conduct our research. I have trouble getting students to visit the library, which means anything not on the Internet is effectively lost to collective thought. Virtual documents are defining our collective knowledge more than physical books and journals. All researchers will change the way they work to take advantage of communication and information available electronically. I would like to see a community like ours set an example for other fields.

Organization

Simply working with the Internet will not guarantee results. I believe some organization is required; good work does not simply appear without high-level planning and design. One could argue that the free software movement is a counterexample, where there is no top-level organization and good systems evolve in a bottom-up process. The problem I see is that, often, free software is actually not well designed and lacks input from the experts who might improve matters. Free software often works best when recreating the functionality of an existing software product, eliminating some of the need for top-down design, but reducing the degree of innovation.

Initiative

To overcome the limitations of free software development paradigms, contributions from experts are essential. Academics have a tendency to write about the flaws in the current practice and to propose improvements. This is different from actually making the improvements and changing the current practice, as this would be "non academic" work. I think when we talk about building a community and supporting the community practice with tools and resources, it is necessary for the experts to be involved, to take the initiative to make things better.

Examples

All this is easy to write about, but much harder to turn into practice. Perhaps these ideas are naive, and certainly changing a culture is not easy. At least it is a useful exercise to create a vision of how things might be. Creating and sharing a vision seems to be necessary for change, if not sufficient. On the positive side, I think many of us already share this vision and many have made progress. There are many good examples of software created with the needs of our community in mind, and I will mention some of them here:

- PortMusic: PortAudio, and PortMidi are APIs implementing cross-platform access to audio and MIDI I/O. Think of these as a "stdio" library for music. (For non-C-programmers, "stdio" allows C programs to read and write files; where would C be without it?)

- Audacity is a cross-platform, free software audio editor that is especially good at handling large files.

- Synthesis systems, including SuperCollider, csound, Nyquist, jMax, JSyn, and STK are perfect examples of well-designed and supported systems created especially for our community.

- Open Sound Control (OSC) offers real-time, cross-platform, network-based communication especially for music applications.

- PlanetCCRMA, while not really a software project, organizes knowledge and software distributions to help the computer music community use a Linux optimized for music.

I am sure this list could be longer, but these examples are sufficient to illustrate my point, that this community is capable of working together to improve our tools and resources. While all of these projects offer usable software now, most of them could use more help to make them complete and reliable.

As a community, one of the toughest problems is to collectively identify the small number of projects we can support with a critical mass of developers and users. Again, the tendency for academics and hackers alike is to make small improvements or to focus on one narrow aspect of a problem, then distribute a half-baked

"research system" with many rough edges. As a result, we often find many programs available, none of which actually work well enough to be worth using. We need to find a balance between innovation and standardization.

Research Challenges

Building tools is great fun and a worthy occupation, but it is only part of the picture. Most researchers are excited by the really big questions that stimulate our curiosity and imagination. I wish I could formulate grand challenges for computer music the way David Hilbert did for mathematics a century ago, but frankly, it would be foolish for most of us to invite any comparison with Hilbert. Instead, I will offer a more personal view. These are my challenges, and I hope you will find them interesting. You may even want to tackle them yourself, and I would welcome anyone to do so, independently or in collaboration.

Machine Identification of Musical Structure

When we listen to most music, we hear relationships and structure. For example, we may recognize that a melodic phrase is repeated. We can think of the two phrases as related by a time difference. A transposition occurs when there is a time difference and a pitch difference. There are many possible relationships within a

piece of music. Some are important and intentional while others are random and accidental. Recently, I have been working on getting computers to find structure in music, looking mainly for repetition, and then building simple descriptions of the implied structure.

Figure 3 shows some input and output of this program. The audio is from the John Coltrane Quartet playing Coltrane's composition "Naima" and was taken directly from an audio CD. Below the audio you can see a transcription of the saxophone solo represented in piano roll notation. (The middle part is a piano solo, and the transcription did not recover much.) The transcription is far from perfect, but not bad considering that the source is polyphonic audio. The structural analysis program looks for similarities within the transcription. Just below the transcription, there are colored bars representing the final output. Bars with similar colors represent similar phrases. You can see that the opening phrase is repeated immediately (the first two red bars), and then there is a shorter repeated phrase (the green bars), and so on. "Naima" is a ballad in AABA form. The "A" parts are the red bars, but in this analysis the "B" part is subdivided into three parts (green, green, magenta). You can see from this analysis that Coltrane opens by playing the AABA form and closes with just BA. You can also see a repeated 2-measure phrase at the end.
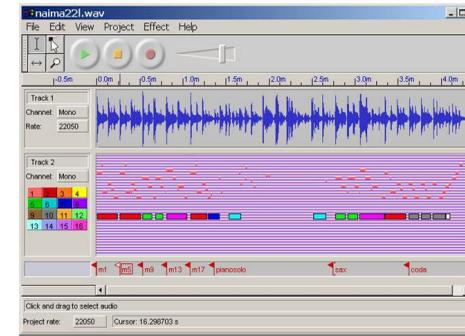
Figure 3. Structural analysis of John Coltrane's "Naima."

(As an aside, Figure 3 is a good example of the kind of research-oriented software tool I advocated in the previous section. In addition to displays of audio, MIDI, and label data, this editor can display time-aligned graphics. I used this feature to create the colored bars appearing below the MIDI data. This facilitates music data visualization and interaction that could not be accomplished with any commercial software).

My advisee, Ning Hu, and I have also looked at spectral features as a way of detecting music similarity, and in general, this works better for polyphonic music. There is much work to be done in this area. How can we detect transposition and other structural relationships? What kinds of musical structure do people actually hear? How do we decide which relationships are significant and which are random? Can we combine information at the symbolic level with features from acoustic representations?

Phrase-Based Synthesis

The second problem I would like to discuss is music synthesis, a topic that has been central to this field from the beginning. It is standard practice in science and engineering to subdivide big problems into smaller problems that are easier to solve. In the synthesis area, this led to a standard model in which music is divided into notes which are synthesized independently and then combined to complete the synthesis process. This divide-and-conquer approach works well in science because most things are independent enough to make progress even when the assumptions are not entirely true. If I drop a ball, the acceleration is about 1G, and even though it depends on such things as my blood pressure, whether I'm wearing gloves, and the air temperature, I do not even know how one could measure all these microscopic effects.

Music is different. The sound of one note depends on the next, so we cannot simply create notes in isolation and expect to combine them to create music. Of course, this independence assumption is fundamental in Music N languages and MIDI, and the assumption is truer of some instruments (the piano) than others (the violin). Figure 4 illustrates the difference between traditional note-by-note synthesis and the concept of phrase-based synthesis.
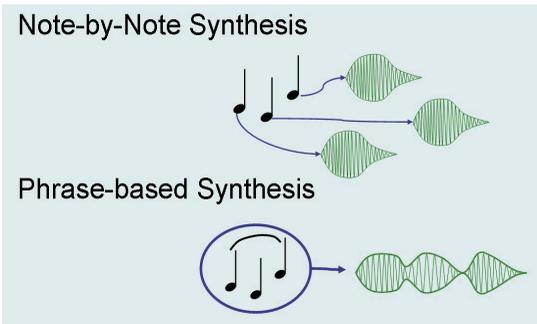
Figure 4. Synthesizing a note-at-a-time fails to capture important contextual information.

To illustrate the effect of phrase and context, Figure 5 shows two amplitude envelopes extracted from a trumpet performance. Both notes have about the same duration, dynamic level, and pitch, but the left one is articulated using the tongue and the right is slurred. The two shapes are nothing alike. You might also notice the quick release at the end of the tongued note. This is characteristic, but only appears when the note is followed by another tongued note. We have always known that the independence assumption is wrong, but we have not made much progress getting rid of it.
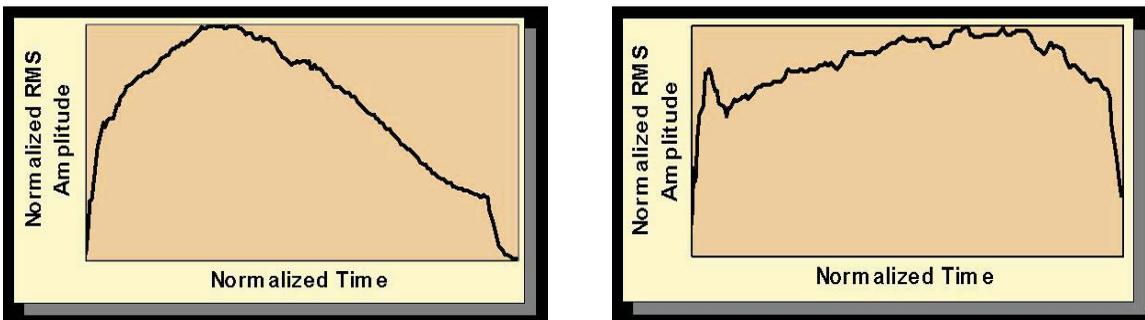
In my work on Combined Spectral Interpolation Synthesis with Istvan Derenyi, we treat trumpet synthesis as a two-step process. First, a score containing phrasing information and other annotations is translated to continuous amplitude and frequency control functions. There are no separate notes in this intermediate representation, just continuous control functions. In the second step, these control functions drive a synthesis process that creates continuously evolving spectra that are appropriate for the given amplitude and frequency controls. It is interesting that we start with distinct notes, move to an intermediate representation where notes do not exist, generate audio, and end up with the *perception* of a sequence of notes.

Our work has only just begun, but I believe at least the concept that notes are not separable can be applied to many synthesis techniques, from spectral models to physical models, and even to samplers and MIDI. In the case of trumpet synthesis, I believe our sound examples

are quite convincing. By using the same synthesis algorithms with note-by-note synthesis and with phrase-based synthesis, we can hear a dramatic difference. I hope to extend our work to handle a greater range of articulation, to extend the work to other instruments, and to automate the construction of instrument models using machine learning techniques.

Combining Light and Sound

Musicians have been interested in the combination of light and sound from ancient times. Recently, however, computers have made it possible to synthesize images at video rates using inexpensive, portable equipment. The use of video projections in concerts is becoming almost commonplace (see Figure 6), but there is still much to be learned. I believe there is room for exploration at many levels. At the systems level, how do we organize software and hardware to facilitate the coordination of images and sound? At the music theoretical level, how do we analyze music that includes images, video, and/or animation? How should composers think about images and sound? From the level of psychology, how do images affect our perception of sound (and vice versa)? Of course, composers are not the only ones thinking along these lines, so there is also a need for cross-disciplinary exchange of ideas.
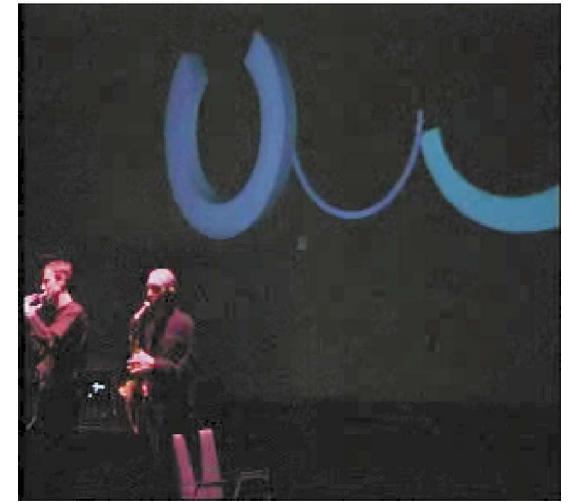
Figure 6. A performance of "Uncertainty Principle" with the author and Eric Kloss, soloists. The image in the background is a projected interactive computer animation that reacts to the soloists in real time.

These questions have no simple answers, and this is a perfect example of why I think of composing as research. Like scientific research, we must begin by studying isolated instances (i.e. composing pieces). As we become familiar with more examples, we develop taxonomies, identify concepts, and form hypotheses. Eventually, our experience is organized into theories such as harmonic theory (in music) or signal processing (in engineering). Some might say that we already have enough music problems to solve, but I think the potential to link images to sounds in live performance is especially important for computer music and is therefore something particularly interesting for our community to explore.

Figure 5. Amplitude envelopes of tongued and slurred

Languages and Systems

To facilitate research in all these areas, we need good tools and good ways to express ourselves. Our community has developed many interesting language concepts (see Figure 7). Music $\mathcal{N}$ offers some unconventional semantics that are both effective for music and lacking in more conventional programming languages. MAX-like languages have proven to be very effective for visual programming of interactive systems. Still, a number of problems remain in music programming systems.
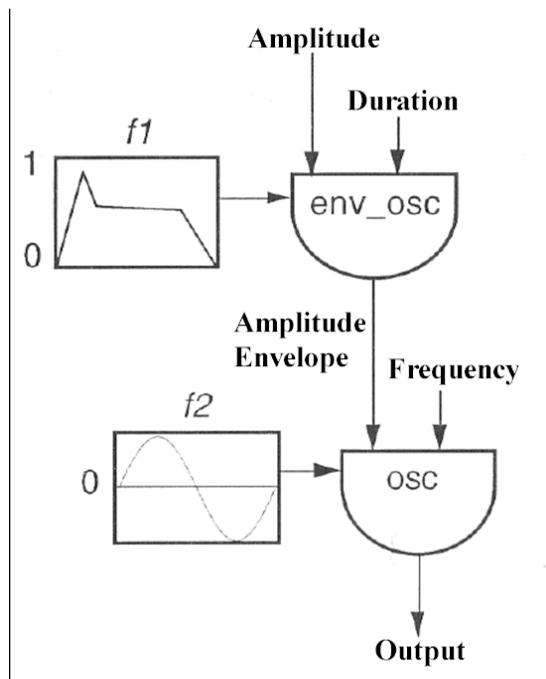
Figure 7. Concepts such as unit generators, patches, instantiation, and scores have led to interesting specialized languages for computer music.

One observation is that all computer music systems seem to have a "sound" of their own. Every system makes certain things easier than others, and this inevitably leads composers, for better or worse, down certain paths and away from others. Most feel that computer music systems should not interfere with the goals of their users, and so language designers must always strike a balance between power and generality. Power comes when you can produce a lot of output or complexity with a minimum of effort. Generality comes when you can achieve exactly the output you want. In contrast, many commercial programs take the opposite approach. They provide strong support for certain styles or techniques of music generation, thereby offering creative opportunities to less-technically inclined musicians.

I believe we are just beginning to explore interactive music systems, especially those that deal with a mixture of audio, control, and sensors. For example, composers are now thinking about signal processing not as an effect but as an integral aspect of composition. While the focus used to be on synthesis, now we see signal analysis as an important component of interactive systems. Music theory, music structures, signal processing, and sound synthesis are beginning to merge in interesting ways. Progress may depend upon systems that simplify the interactive manipulation of signals. Languages and systems can also support

new directions, including music performances over networks and the incorporation of images and animation into music. There are many challenges, and we need to experiment with many new approaches to better understand language and system design for music.

Conclusions

Just as the explosion of computer technology is surely a milestone in human civilization, I believe computer music represents a significant turning point in music history. Instruments augmented the human voice with new sounds and techniques, music notation augmented human memory, and now electronics and computers bring us new ways to store, generate, and process music. What could be more interesting than to be in the middle of an artistic and cultural revolution!

I hope I have motivated you to at least think about ways we can work together to make our work more productive and more rewarding. I have also suggested some research topics that I find most interesting, and perhaps some will join me in their exploration. Regardless of what the future brings, these are interesting times, and we should all be thankful that we can play a small part in their unfolding.

References

Note: A paper like this touches on the work of hundreds of authors and papers. I have elected to cite only the specific work mentioned here, and I will ask the reader to consult the references in these papers and web sites for a broader coverage of these topics.

My work on computer accompaniment was first presented at the 1984 ICMC, although the publication date for those proceedings is 1985: Dannenberg, "An On-Line Algorithm for Real-Time Accompaniment," in *Proceedings of the 1984 ICMC*, Computer Music Association, (June 1985), pp. 193-198. Some relatively early discussion of software synthesis appeared in Dannenberg and Mercer, "Real-Time Software Synthesis on Superscalar Architectures," in *Proceedings of the 1992 ICMC*, ICMA, (October 1992), pp. 174-177. Work on music structure appeared in Dannenberg, "Listening to 'Naima': An Automated Structural Analysis of Music from Recorded Audio," in *Proceedings of the 2002 ICMC*, ICMA, (2002), pp. 28-34, and Dannenberg and Hu, "Pattern Discovery Techniques for Music Audio," Journal of New Music Research, 32(2), (June 2003), pp. 153-164. Phrase-based synthesis, which in our papers is called "Combined Spectral Interpolation Synthesis," is described in Derenyi and Dannenberg, "Synthesizing Trumpet Performances," in *Proceedings of the ICMC*, ICMA (1998), pp. 490-496, and Dannenberg and Derenyi, "Combining Instrument and Performance Models for

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I gave some examples of what I consider to be good examples of research-oriented software tools. More information can be found in Bencina and Burk, "PortAudio -- an Open Source Cross Platform Audio API," in *Proceedings of the 2001 ICMC*, ICMA, (2001), the PortMusic web site, Mazzoni and Dannenberg, "A Fast Data Structure for Disk-Based Audio Editing," in *Proceedings of the 2001 ICMC*, ICMA, (2001), pp. 107-110, James McCartney, "Rethinking the Computer Music Language: SuperCollider," *Computer Music Journal*, 26(4), (Winter 2002), pp. 61-68, the csounds.com web site, the Nyquist web site, Déchelle, Borghesi, De Cecco, Maggi, Rovan, and Schnell, "jMax: An Environment for Real Time Musical Applications," *Computer Music Journal*, 23(3), (Fall 1999), pp. 50-58, Burk, "JSyn -- A Real-time Synthesis API for JAVA," in *Proceedings of the ICMC*, ICMA (1998), Cook and Scavone, "The Synthesis ToolKit (STK)," in *Proceedings of the 1999 ICMC*, ICMA, (1999) and the STK website, Wright and Freed (1997), "Open Sound Control: A New Protocol for Communicating with Sound Synthesizers," in *Proceedings of the 1997 ICMC*, ICMA, pp. 101-104 and the OSC web site, Lopez-Lezcano, "The Planet CCRMA Software Collection," in *Proceedings of the 2002 ICMC*, ICMA, pp. 138-141 and the PlanetCCRMA website.

Impressions of ICMC 2003
Yuan Peiying

As the final notes of Steve Everett's *Gamelan Asmaranda* lingered in the air, signaling the end of the International Music Conference 2003, I was overwhelmed with a cascade of thoughts. What came to mind immediately was most definitely regret and remorse that there would possibly never be another chance to participate in such a conference in Singapore ever again. Thankfully, however, I had managed to learn many things from the conference and I am glad that I have been given this invaluable learning opportunity.

There were several memorable events that had taken place throughout the five eventful days of the conference. When attending concerts, what amazed me most was the realization that computer music is actually a very 'real' form of music. The sounds, although digitally enhanced and altered, are most realistic and are a reflection of the everyday sounds we come across. There is no shortage of compositions by various composers to prove this point. Rikhardur H. Fridriksson's Lidan II,

showcased during the last day's evening concert, is one example. The sounds used had real-life origins, which were the coughs and gasps produced by the human vocal cords. Moreover, the piece was inspired from and a direct consequence of a period of bad health and respiratory disorder of the composer himself, thus highlighting the reality attached to the sounds of computer music.

I sat on the bus the other day and was perturbed by the screeching noises of the brakes. I walked past a construction site this afternoon and for the first time, I wasn't irritated by the blast of sounds. Instead, my mind was imagining how I would be able to use these sounds in my compositions. These are but two examples of how my participation in the conference has broadened my perception of music and triggered off much creativity and imagination.

The range of compositions presented was wide and a definite eye-opener. Besides more 'traditionally' computer music sounding works, like Apostolos Loufopoulos' *Night Pulses*, whose night sounds were quite distinctly simulated through computer mediums, there were slightly more avant-garde sounding works, as well as works that challenged the norm and brought in other influences. Works like Naotoshi Osaka's *Mirrors* for hichiriki (a traditional Japanese wind instrument),

Paul Rudy's *Fantasie* for erhu and Pierre Alain Jaffrennou's *Study* for pipa drew distinct inspiration from traditional instruments of the Chinese and Japanese civilizations. However to a certain extent, one can say that exploration into these instruments have been made before and there is relatively little that composers can offer in writing new music and exploiting new sounds from these instruments. On the other hand, there were composers who dared to divulge into the less explored. Of particular mention is Shahrokh Yadegari's *Traditionally Electronic.* The title itself suggests a juxtaposition of traditional and electronic elements, which is what takes place between the Indian/Persian violin and vocals, and the computer. The result of this unusual marriage of Indian performance technique (with its Persian origins) with the 'Western' computer is a delightful creation of new sounds and spiritual awareness. Combined with the intricate setup of lush, rich-coloured rugs and a drone-box to boot, the spiritual realm created by electronically processed traditional violin and female vocals was unforgettable. It was as if the audience was being transported into a different world and experiencing a certain degree if soul-enlightenment. Such is the power of the combination of elements.

Another piece which struck me was Mark Applebaum's *Pre-composition*, a hilarious work that is in actual fact an ironic and sarcastic exorcism of the often irrational 'council of elders' in the composer's head. This work for 8-channel tape tickled so many bones that I was still laughing to myself about it back on my way home. But what made it so successfully sarcastic was that it highlighted exactly the way computer music sounds when clichéd and simplified. The twist at the end involving a 'radical' method of ending that particular 'composition' was, in itself, refreshing, one of those things that just make you go 'wow, why didn't I think of that?' This piece earns points for being original in concept.

Although all the pieces showcased are masterpieces themselves and deserve much credit and recognition, there is this biasness on my side as an audience to particularly remember pieces that, besides providing audio pleasure, are accompanied by visual images too. Several pieces had live performers on stage or were in the form of videos, but by far the most successful combination of audio and visual mediums must have been the silent movie screened on Italian night, with live music provided by the Edison studio. The music was well-paced, suited to complement the film, and was also effective in creating suspense in this horror film. The drama created would not have been possible without the excellent live music provided that night. Although it is true to say that when watching a film, the visual impact always hits hardest, it is the music and sounds that complete the whole experience and help paint a certain, complete atmosphere. As much as the conscious mind refuses to listen to it carefully when it is being pre-occupied with processing what showing on screen, the sub-conscious is actually processing it. So even if the audience walks away not distinctly remembering any of the music, credit must still go to the musicians who worked hard in letting audiences enjoy the movie tremendously.

It is weird to mention in this essay that it is almost always hard for audiences to know when a piece of music has properly ended. Applause at the end of the song often comes hesitant and half-hearted, because audiences are often in doubt as to whether the piece has formally come to an end. An analysis into this 'problem' shows that it is not so much that people have been bored by the music or do not like it. Very often this is not the case. People may be very willing to show their appreciation of the work through thunderous applause, but are not sure of when to show their appreciation. Perhaps it is the use of silence and space in computer music that makes the ending so ambiguous. The three dimensional concept of space, when used in an audio medium, is effective to create musical tension and anticipation, but it evolves into a problem for audiences at the end. The simple question of 'has the music ended?' becomes a problem then. This is non-existent for traditional Western works because of certain 'often-used', stylistic methods of ending a piece, but computer music is different because it is so divergent in styles and concepts. Furthermore, the lack of a person to cue the audience to applause, a common practice for Western classical performances, adds on to the ambiguity of the end of the composition.

On the whole, my participation in this conference has been a definite eye-opener. From a person who knew relatively little about computer music, or to stretch it a little, never really liked electronic sounds, to a person who can now hear a sound and imagine how control of the sound could turn it into music, I am extremely glad that I have been exposed to computer music through this conference. The wealth of creativity that comes from immersing myself and soaking up as much music as possible from five consecutive days may be straining but definitely worth it. Now, to stretch my imagination further, maybe, if I work hard enough, I might have the chance to travel overseas and participate in such a conference again in the next few years!

ICMC 2003 Concert Reviews

30th September Tuesday Evening
Diana Soh

The opening concert to ICMC 2003 was no disappointment. Presenting works by Naotoshi Osaka, Diane Thome, Anne LeBaron, Matthew Adkins and Heinrich Taube, that night showcased a variety of high quality music that prefigures the other concerts to come.

The concert opened with *Chiekagami* by Naotoshi Osaka. It is a composition for Hichikriki and Live Electronics. The Hichiriki is a Japanese double reed woodwind instrument sounding rather similar to a 'higher pitched' oboe. The appearance of performance in a traditional Japanese costume added to the virtual impact of the piece. Otherwise, the piece remains an obscure interest without understanding. At least it is so for a layman like me whose interest is only kept alive by the unique sound of the instrument and the awaiting of the next interesting element that was to be presented.

Estuaries of Enchantment by Diane Thome seemed to appeal to me more with the images of the river and sea and water in general being evoked. A composition for oboe and tape, the sounds from the oboe and the electronic part were integrated nicely, truly enchanting listeners with the at times dramatic outburst and the move towards a resolution of that.

Following that, *Inner Voice* by Anne LeBaron was a virtuosic success for the double bass and live electronics. The eye-popping 'stunts' that the double bass player pulled complemented by the live electronics were successful in simulating the compositional intent and forming the 4 primary sources of the sound environment of the piece. This piece is well received judging from the volume of the applause from the audience.

The penultimate work was by Matthew Adkins. *Symbiont* is a work that plays with the notion of balancing opposites. By defusing the sounds into 8 channels, the work provided much appreciated stimulation for the audience. The effect of which was amazement.

Aeolian Harp by Heinrich Taube concluded the opening night nicely with the composition for piano and live electronics. Performed by Albert Tiu, assistant professor of the piano department at the Yong Siew Toh Conservatory of Music, the sounds from the tape and that from the piano fused really well and the overall effect presented felt rather rhapsodic. The idea of transformation is clearly evident in the music. It dawns upon me that there is a huge difference listening to a piece of electronic music on a recording and listening to it live. The impact of the live performance was much more intense and it was almost as though the recording of the piece and the live performance were of two different sound environments. However, I delight in the fact that had I not tested the tapes (to make sure they played in our equipment) I wouldn't experience the difference firsthand.

1st October Wednesday Afternoon
Bonnie Miksch

Ian Whalley's *Kasumi*, an evocative tape work which uses environmental sounds and recordings of traditional Mäori instruments from New Zealand, invites the listener into a world of quietude and lingering moments of beauty. Simple unprocessed sounds, such as the opening flute, reflect the austerity of the Japanese poem on which this piece is based. As the work unfolds, some sounds are treated with processing techniques, but the transparent nature of the sonic materials is never compromised. Throughout the piece, the composer reveals a meticulous attention to temporal articulation and clarity of events. Overall, this stunning work was fresh and enticing to hear, but increased attention to spatialization would have helped to further refine the intricacies of this lovely world.

Retake for flute and live computer by Andrew May and Elizabeth McNutt puts a performer-oriented spin on the process of composition. One of the few improvisational works on the festival, *Retake* uses an intricate web of response-based improvisation. The improvisations are manifested through three distinct relationships: between flute and pre-recorded/transformed flute, between computer and flute, and between computer and pre-recorded/transformed flute. McNutt, who improvises the live flute part and controls the onset of sections of pre-recorded/transformed flute, traverses this alternative performance environment with the grace of a seasoned traveler, instigating and building upon diverse textures and gestures with a willingness to engage her virtual colleagues. The live computer part, programmed by May, adds synthesized tones and drum parts to complement the flute sounds, and these virtual instruments respond to McNutt's performance. Strikingly absent from this piece is the traditional relationship between composer and performer we have come to expect from concert music. Instead, May and McNutt obliterate the stifling roles of performer and composer; even the computer has a chance to express herself in real time.

Noemata, a video piece by Shigenobu Nakamura and Robert Darroll, shows the chaos of modern Japanese society.

Throughout the work, dichotomies between the organic world and the technological world are explored. Scenes of water, plants, clouds, and sunspots were contrasted with scientific imagery and digital graphs. According to the composer, the music was created "to amplify characteristics and features of the image," and this goal is accomplished through rather literal correspondences, such as a direct correlation between visual density and sonic amplitude. The binary nature of the video is mirrored in the music, with the contrast of organic sounds such as breathing with synthetic blurps. Overall, the piece presented an overload of information in a brief timeframe, accomplishing the goal of expressing chaos.

Hideko Kawamoto's *After the Summer Rain* for piano and tape seemed to occupy two simultaneous worlds. The tape part is texturally and gesturally rich, evoking natural sounds without using them literally. The piano part, on the other hand, adheres to a strict pitch sensibility, and its note-oriented nature keeps it quite separate from the tape. According to the composer's own notes, the two parts serve unique referential functions, so this disparity is not surprising. Rather, it presents a challenge for the performer to use interpretation to help connect these conflicting musical words. Having heard a more inspired performance at the Bonk Festival of New

Music, I am inclined to believe that the fragility of this work did not stand up to this particular performance. That being said, there was much to admire in the composition of this work, particularly in regards to the superbly crafted tape part.

I suggest that *Pre-Composition* by Mark Applebaum be required listening for anyone in the academic computer music community. Applebaum performs a schizo-analysis upon a hypothetical composer, dividing their psyche into eight independent voices; the crafty Applebaum uses his own voice to realize each of these mental agents, and they are assigned to a unique loudspeaker in performance. The piece is a dialogue of these eight independent personality fragments which act through negotiation to construct a new piece of computer music. Though a hilarious vocal simulation of computer music, *Pre-Composition* deftly parodies a compositional process which simply chooses "to select a desired message out of a set of possible messages". Clever and engaging, the piece is an important antidote to the monolithic calcification of academic computer music aesthetics.*

The "electrocution aesthetic" of Gerard Eckert's *Klangräume* for piccolo and tape was powerful indeed. The textures in the tape part were deliciously fat, and the agitated and granulated piccolo, punctuated with high register squeals, propelled the work

forward in a mad flurry of hyper-activity. The piccolo part, hovering on the edge of impossibility, lent a marvelous frenzy to this work. This precarious balance was maintained through the herculian efforts of flautist Beatrix Wagner, a virtuoso of monumental proportions. Although a mere six minutes in length, *Klangräume* packed a whallop!

Konstantinos Karathansis' *Allegoriae Sonates* used recorded piano sounds excited with a small copper bar to create an extensive palette of sonic material treated as discrete sound objects. Throughout the work, the composer's technical chops were revealed in the skillful application of processing techniques. While some gestures in this work mimic too closely the hand-me-down effects of the acousmatic variety, the composer explored an exceptionally wide range of frequency, amplitude, textural density, timbre, and temporal density. This maximalist approach could have benefited from an increased use of spatialization. Occasional loud bludgeoning sounds were difficult to stomach at the performance level chosen, but this could no doubt be corrected.

Jon Christopher Nelson's *L'horloge Imaginaire*, an 8-channel fantasy based on a wide range of clock sounds, maintained remarkable equilibrium between precisely pitched and percussive sounds and between referential and abstract sounds.

Throughout the work, the composer demonstrated a skillful use of space in the placement of easily localizable sounds and a marvelous attention to contrasting textures. Several intense crescendos provided moments of invigoration, yet the all too familiar "thwack" which followed each one confined the work to a more derivative aesthetic.

Per-Anders Nilsson and Jim Berggen's stark video work *Memento Mori* led the audience through a trance-like trek which slowly unearthed the mysteries of mortality. Images of time suspended were mirrored in the accompanying sound, and the composer used processed metal sounds and filtered noise to create an eerie backdrop. The video literally portrays a lingering walk through several animation sculptures, many of which reveal an anthropomorphic embodiment. Although static in nature, the video cleverly shows the passage of time with changes in lighting. A brilliant collaboration, *Memento Mori* distinguishes itself through its novel use of temporal and virtual spaces, sinister sounds and silences, virtual apparitions and omens.

* comments on Mark Applebaum's work written by Christopher Penrose

1st October Wednesday Evening
Christopher Penrose

Paul Rudy
Fantasie

Taken in entirety, Paul Rudy's work, *Fantasie*, for gaohu and computer music accompaniment was an odd juxtaposition of musics. Much of the piece was subtle and beautiful; the idiomatic writing for the Chinese gaohu was accompanied by rich sustained tones whose pitch trajectory evolved ever so slowly. Teo Kar Li, the remarkable gaohu performer, unleashed an excellent performance -- yet the cadenza in the work was less interesting than the surrounding music which emphasizes the strong synergistic effectiveness of the piece. Also notable: the piece was thankfully free of the many bombastic and hackneyed gestures common to computer music of the academy.

But toward the end of the work, I encountered a cataclysm of astonishment. The elegance of the piece was rapidly erased by a strange bluegrass music. I am not at all prejudiced against the folk music of Appalachia, but this hoedown ending was downright corny and reeked of forced simulation -- it was as if Teo had a Tomahawk cruise missile aimed at her head and was emphatically forced to "play like an American!" The music sent a strange and unequivocal message that I don't think Paul intended: "American imperialism is victorious!"

Antonio Ferreira
Gist

Gist was a competent piece, well assembled from a technical perspective, but I had a strong sense of deja vu as the piece unfolded. Antonio Ferreira's studio work, unfortunately, was a de rigeur parade of cliche timbres and gestures that are all too common in computer music of the academy. For the most part, the music served to perpetuate an established aesthetic without making a significantly unique and individual artistic statement. The acousmatic ***thwack!*** (an ominous crescendo followed by a sudden percussive attack), was employed several times during the piece. It is amusing that a piece like Mark Applebaum's *Pre-Composition*, which was programmed earlier at the conference, openly parodies this particular gesture, and this work, "Gist", utilizes it openly in dogged earnest. The contrast of intentions is profound and interesting in of itself. While a composer may employ any musical forms of their desire, a composer may want to consider how the interpretation of established gestures may vary and evolve as their bombast and ubiquity drives others to parody them.

I did find some interest in the initial stages of the piece. Contrasting filtered noise textures would fuse gradually through use of global resonance, or change suddenly to a different configuration. But many of the textures were constructed from white distributions of pitch and time -- the lack of specificity was tiring to the ear and I readily recognized the sounds as being unerringly similar to sounds found in countless other works. I longed to experience a music that at least sounded as if it was crafted, rather than experiencing sound which seemed to be built from the most commonly used GRM Tools presets.

Ryan H. Torchia
"… and then eventually, 10^-43 second later …"

This work had a simple, singular form which served as an effective vehicle of timbral exploration. The dramatic volume of the introduction gently ebbed and subsided level establishing a rich beating drone. The texture ebbed with dynamic peaks and sudden shifts of harmony. At times the work was articulated with clear high frequency resonances and others, the harmonicity was more vague. The smooth, ominous continuity established in the work reminded me somewhat of Johannes Goebel's *Vom Ubersetzen Uber Den Fluss*. An interesting yet somewhat singular exploration of timbre and continuity, I felt that the piece was a very good duration for its musical ideas.

Evidence
(Scott Smallwood & Stephan Moore)
"Chain Of...."

It was refreshing to experience a collaborative laptop piece on this concert. There are two ways of describing the opening of this work: the banal and unimaginative reviewer would suggest that they were reminded of autos passing on a highway, and the new age liberal reviewer would perhaps hear the cries of gray whales asking gently for a new water reclamation system. The multiplicity of interpretations that I heard alone indicated that the opening of their performance was effectively evocative.

As the piece evolved the performers would obscure their textures with the sonic equivalent of venetian blinds. Continuous, masking sounds would ebb and shift -- they changed the frame of reference for the surrounding rich, vaguely acoustic texture. Also there were airplanes, which gently revealed themselves, though they had served as processed source sound for quite some time in the performance. Their revelation was a bit of a disappointment, as it unveiled the mysteriousness of their performance. The piece took a robotic turn with the entry of a particularly metronomic pulse. While the performers are obviously nodding to dance music, I felt that the they could learn a thing or three from the intricate dance music of the late 1990's. I felt that the pulse served more to

make a dated subcultural association than it added to the musical context. Overall I enjoyed the dense and free sonic explorations of their performance.

Eiji Murata
Cross Projection

A work for flutist and computer performer, *Cross Projection* was well performed by both musicians - human and software. Unlike other pieces on the program, this work sported a significant number of silences. A computer happily accompanied the measured flute performance; she, the computer, dutifully tracked the flute utterances and she never seemed to make sound while the performer rested. For much of the piece, the harmonizations and counterpoint provided by the computer were quite rich and dynamic. They even provided convincing and rich timbral evolutions. Yet despite the dramatic golden mean contour of the piece, which provided an evolving large-scale change, the consistent relationship of the computer accompaniment to the flute was somewhat static; it could have been less strict in its nature.

David Kim-Boyle
Chorale

This work uses a studio recording to resonate the strings and soundboard of a handy piano. The recording is played by loudspeakers positioned inside the piano and a microphone is used to project the resulting sound to the audience. The resulting work is a beautiful, smooth texture ebbing with rich beating. The piece was quite singular and encapsulated in form, yet the timbral evolution of the piece was subtle and compelling. Though brief, I found it quite difficult not to fall into a relaxing alpha state as the piece unfolded.

It is impossible for me not to mention David Behrman's *Wavetrain* here. While I found *Chorale* to be very beautiful, I can't help but think that a work like *Chorale* would be even more rich, dynamic and interesting if he had chosen a live electronics approach for his work that employed feedback between the output of the resonance system and its inputs.

2nd October Thursday Afternoon
Johanna Devaney

Thursday October 2nd's afternoon concert showcased five works inspired by a variety of music traditions. These works linked with each other in a variety of ways -- the most obvious link being the use of traditional materials; either writing that inspired the development of the piece's musical material or the use of traditional instruments either as sample sources or live in performance.

The concert opened with *The Empty Palace* by Pär Johansson, a tape piece built on a timbrally disparate collection of samples. Effective use of spatialization and a seemingly "organic" development of the material served to balance the sample material. This "organic" development worked well through the opening and mid-sections of the piece, where it provided internal and relational senses of cohesiveness. The sense of development halted in the final section leaving the impression that this material was appended, rather than being an integral part of the whole.

The second piece on the program stood in marked contrast to the first; *Traditionally Electronic* by Shahrokh Yadegari combined traditional Persian vocals, violin, and kamancheh, with computer processing. The stated aim of the composer was for the performers not to stray too far from the performance practices of traditional Persian music and that the computer merely serve to complement the performance. The performance was very good; the performers achieved a wonderful sense of a swelling development through the piece while the computer supplemented this with layering and a extensive amount of reverb. However, one was left wondering if the possibilities of integrating the capabilities of computer processing into the traditional performance practice were fully considered and explored. The piece's strength truly rested with the performers and the computer was very much relegated to the role of an interesting supplement.

The third work, a the tape piece by Yasuhiro Takenaka entitled *Kagula* was build on samples of a traditional flute (kagula), birds, and a set drum loops. The opening section of the piece introduced the samples and explored their timbral interaction before moving into an intense electronic mid-section. The intensity faded to a glissy synthesized section before returning to the drum and flute patterns of the opening supplemented with vocal samples. The composer's aim of two contrasting "poles" was clearly audible and the piece achieved a well-developed climax, however the fall off from this climax was a little abrupt leaving the listener a little unfulfilled.

The tape piece *Changing Weights* by Ron Herrema opened with synthesized tones and string samples juxtaposed in rapid rhythmic patterns. While initially engaging, the lack of development throughout the opening section left one waiting for "something" to happen. Eventually a third element was added, but while this synthesized piano sound did present new musical material it did not add anything timbrally to the mix. The bell-like sound added later did provide some interesting timbral variation but overall the piece felt rather static.

The final piece on the program was Paul Hogan's *Drum and Grain* for percussion trio and tape. The rhythmic material in the piece was inspired by drum 'n bass break-beat style rhythms and the tape

component, as the title suggests, made use of various granular synthesis techniques. Like Traditionally Electronic the performers were the focal point of the piece, though here the electronic (tape) component assumes a more central role in the development of the musical material. The performance, while commendable in a number of respects, did not provide the accuracy that the complex rhythms of the piece required to achieve the correct balance in the trio. In general the conductor kept the ensemble together but at times the performance was not entirely 'tight'. Due to technical constraints gamelans were substituted for the toy pianos stipulated in the score in the final section of the piece. While not achieving the "playful" element intended by the piano pianos, the gamelans did, in the context of this particular concert, provide a link with the traditional instruments used in the some of the other pieces on the program.

2nd October Thursday Evening
David Kim-Boyle and Ryan H. Torchia

The "Italian Night" concert was one of the more highly anticipated events of the 2003 ICMC, and did not disappoint. The evening began with an introduction and a brief address by the Italian Ambassador to Singapore, H.E. Guido Scalici. In his speech, the Ambassador called the screening and soundtrack performance of *Das*

Cabinet des Dr. Caligari "A Truly European Project" noting that the German film had been restored in Bologna.

Prior to the screening of the film, the audience was treated to two other videos: Dennis Miller's *Vis-à-vis* and Kristine Burns' *Liquid Gold*.

Vis-à-vis combined synthetic sound and images into flowing, beautifully rich liquid forms. The work was organized into three distinct sections of approximately equal length; each section introduced its own unique elements while developing material that preceded it. Throughout the video, the striking, abstract metallic images and scraping, vaguely mechanical sonic material complemented each other perfectly. By deftly balancing the importance of sound and image in this work, Miller was able to create a true multimedia experience which functioned beautifully as an artistic whole.

Unfortunately, technical problems caused the screening of Kristine Burns' *Liquid Gold* to be postponed to the following night.

The feature attraction of the evening, and one of the true musical highlights of the conference, was the world premier performance by the Italian ensemble Edison Studio of their soundtrack to the German horror film *Das Cabinet des Dr. Caligari*. The film, made in 1920, was directed by Robert Wiene and had been brilliantly restored.

Visually stunning and with powerful Expressionist imagery, the music composed and performed by Luigi Ceccarelli, Fabio Cifariello Ciardi, Alessandro Cipriani, and Mauro Cardi provided a compelling accompaniment to this silent classic.

Inspired by the unsolved murder of a girl during a carnival, director Wiene hired Expressionistic designers Hermann Warm, Walter Roehrig, and Walter Reimann, all affiliated to the magazine Sturm, to design the innovative painted sets that included distorted perspectives, twisted shapes and sharp angles with the purpose of trying to expand the cinema beyond its obsession with simply mimicking reality. The finished film, originally released with an elaborate green, brown and cold blue tints, thrust German cinema to world prominence and had a tremendous influence on cinematic art worldwide.

Providing a soundtrack for such an important piece of cinematic history must have been a daunting challenge, but Edison Studio met and exceeded expectations. Using symbolic sonic backgrounds and foregrounds, and dialogs in "improbable" languages, the soundtrack was a richly layered and aggressively beautiful piece of work, often as angular and unsettling as the film's visuals. At times, the performance blurred the lines between music and foley, and was often a dramatic melding of textures and timbres familiar to computer

music composers and the more theatrical musical drama one would expect in a suspense movie soundtrack. All in all, the performance was a respectful yet arresting, loving homage to what in less capable hands could easily have descended into parody.

3rd October Friday Afternoon
Andrew May

Like many of the events in ICMC 2003, the afternoon concert on Friday 3 October presented a wide variety of delightful and imaginative sound worlds. Sadly, nearly half of the composers involved in this concert were not there to experience the fascinating context in which the concert's organizers placed their works.

The concert opened with Jøran Rudi's *Babel Study* for tape in 5.1-surround sound, an odd and sometimes grating work that lives up to the composer's description of "an exploration of noise – broadband, unpitched, and non-referential." Rudi showed a wide-ranging sonic imagination in this work: outbursts of grainy broadband noise were transformed into metallic rattles, and later glassy percussive hits and clusters; a gradual sweep from a high whine to a low roar, punctuated with almost vocal filtered timbres, gave way to clouds of granular sonic dust and the rushing of wind-like noise bands. The composer compounded the challenge of the refractory sound materials

by giving many of the sounds (particularly in the opening section of the piece) simple on/off envelopes. While many sections were reproduced at an uncomfortable dynamic level, and a good deal of the sound world of the piece is resolutely abrasive, on a formal level the piece presents a plausible language of noises.

Joao Pedro Oliveira was represented by *Mahakala Sadhana* for tape. This elegant soundscape, described by the composer as "a western perspective about some musical traditions of the eastern countries," focused primarily on sounds hearkening to vocal and metallic percussion archetypes. The reverberant cymbal-like sounds of the opening morphed into low vocal timbres, followed by gong-like outbursts and glides, chimes and bowed metal sounds, and other elegant and imaginative sonic textures. Oliveira showed subtlety in balancing shifting timbre groups, mediating between clusters and areas of harmonic clarity, and creating a seamless flow through a beautiful palette of timbres. On the larger scale, the work seemed to lack shape, in part owing to a relatively flat overall dynamic and timbral density. The deliciousness of the sounds sufficed to maintain interest in any case.

Relief Okett for 8-channel tape by Sun-Young Pahg was constructed from environmental sounds recorded in Korea. The admirable spaciousness of this work, both

in time and timbre, seems to grow naturally from these varied sources. Starting softly with sounds of air, metal clanging, and buzzing resonances layered with distant tones in the background, the sound moved quickly into an array of distant voices, followed by a distant and somewhat menacing low percussive sound that gradually closed in, crescendoing to the slamming of a door. A long pause ushers in another crescendo of rushing air, crossfaded with the rhythmic sounds of metal scissors. Later in the work, loud explosive, gong-like, and rumbling sounds are balanced against spatialized sounds of spinning objects and small metallic percussive sounds. The composer invokes her experience of Korean landscape painting as a metaphor for the construction of this piece: "if one's focus slightly moves, another point may become foreground and the previous foreground recedes." This metaphor for musical form is reminiscent of ideas of Charles Ives, as is Pahg's use of strongly iconic materials layered in varying degrees of density and contrast.

The intermission of the concert was enlivened by an installation by Margaret Schedel, *Corporealization of Microphone*, with percussionist Ngoh Keng Seng in the center of a multi-microphone cage whose various outputs were recycled in various delayed combinations by a Max/MSP patch. The output of the patch was diffused through speakers at the corners of the cage, firing

outward—which successfully prevented feedback, but must have created an odd sonic environment for the performer! Claves, bamboo chimes, a snakeskin frame drum with rattles, a rain stick, cymbals, darabukka, and other instruments were played according to a graphic score in various locations within the cage. Despite some dropouts, occasional distortion, clicks and other artifacts of the technical apparatus, the work was effective and well suited to the open space of the concert hall's foyer. The composer's intention to "create multi-dimensional, recursively folding sound cascades" was generally realized in the performance, though somewhat greater density and interpenetration of sounds would have been needed to realize the goal of an "aural equivalent of M.C. Escher lithographs." The installation presented an intriguing sonic/spatial conundrum for conference participants throughout the weekend.

Christopher Morgan's *Brittle* for 8-channel tape lived up to its name with a panoply of thumps, jingles, scrapes, and other knocking, bouncing, rattling, rolling, and wobbling sounds made with "recordings of everyday household sounds." These whirled around the audience, dividing, refracting, and interpenetrating one another in lovely combinations and clouds of sound. Another concertgoer suggested that the diffusion should have been louder to allow us to hear the definition of the sounds

better, but the sounds were nevertheless quite clear and distinct in spite of the wild turmoil of their commingled textures. The abundant generosity of sonic materials made for an enjoyable ride, even though the piece didn't really establish a coherent language of timbres and textures.

Bob Sturm diffused his *Pacific Pulse* for 8-channel tape in concert. Based on the composer's work in "ocean buoy spectral sonification," which he describes as "parametrical representation of data using sound," this work included four distinct sections. The first focused on continuous timbres, pitched and ringing, grouped in a few well-defined outbursts and then growing to a continuous pulsing, roaring, rushing onslaught of sounds. The second section focused on tingly, metallic high partial sounds, continuous but wavering. The third created a seamless texture of undulating timbres and intensities out of what sounded like bursts of filtered noise. The fourth section focused on non-harmonic timbres, glissandos and filter sweeps, punctuated by low bass rumbles. It is unclear to what extent the composer mediated the data taken from observations of the California coastline and its various movements, and to what extent he simply transformed them into sound through strict algorithms. The results, at any rate, are interesting representations of one of the great forces of nature through a varied and often beautiful sonic landscape.

Cort Lippe's *Music for Cello and Computer* was the only interactive work on this program. Cellist Chan Wei Shing presented this unusual and beautiful work with meditative focus and intensity, relying on an elegant tone and refined technique (in keeping with the overall level of live performances at this ICMC, which was exceptionally high). The form of this work was unambiguous: a gradual crescendo from a spacious and thoughtful opening of isolated gestures to a frenzied peak of activity, followed by another more varied buildup and decay of musical activity. The cello's role was almost self-denying: short gestures and outbursts including pizzicatos, *sul ponticello* passages on open strings, brief chromatic gestures, chromatic clusters across strings, and glissando gestures take the place of the soaring melodic lines cellists are usually given. The computer matched the cello's asceticism, beginning with quiet chirps and flutters and only gradually building in density and amplitude with increasingly disturbed churning, sizzling, and exploding timbres. Lippe nevertheless used a full range of technical opportunities in a virtuoso computer part that he described as using "granular sampling, cross-synthesis, and FFT analysis/resynthesis using an oscillator bank, as well as more standard signal processing such as harmonizing, frequency shifting, phasing, reverberation, spatialization, etc." This varied technical apparatus thankfully did not claim the foreground: instead, the shifting chamber music relationship between cello and computer made for a fascinating conversation that shaded and reinforced the sonic tapestry of the work.

4th October Saturday Afternoon
Andrés Lewin-Richter

We regret that on this ICMC meeting many composers did not attend, which could always enhance the performance and give more emphasis on certain aspects of the pieces. The concert started with Eric Chasalow's *Due (Cinta) mani* performed by pianist Albert Lin (due mani = two hands), deriving its title from the "cintamani" pattern, three flaming pearls over sea waves occuring in many oriental textiles, a clever piece with good tape interaction, it almost sounded as a live computer interaction, it reminded a Boulezian type of piece, which keeps the public a bit distant, but overall an interesting piece. *Umidi Soni Colores* by Kotoka Suzuki is a video piece showing geometrical figures in the background with developing images supporting the action of Anna Widmer as dancer, the music is very appropiate for the image but has very little relationship with the image development. David Berezan *Baoding*, based on the baoding balls, is a noise study in three parts bearing very little relationship with the Chinese world and the supposed motiv of the title, in spite of the litterature of the program text by the author. *Hang Time 2 on Jones Street* by Reynold Weidenaar for video and live performer, Geard Errante, clarinet, showed no retationship image with music, it shows the degradation of a street in NYC, it was thought by the artist as a soundscape, it could have been an installation, the reality sounded as an improvisation, cleverly played by the clarinetist. *Chant des Femmes* by Howard Sandroff, played by Alexander Viazovtsev on several flutes is based on a tape material developped from flutes, the piece resulted little musically attractive and too long, Video-artist Samantha Krukowski *Salt and Glue* with music by Daniel Nass was a rather nervous film and the music did not help to correct the situation. Bonnie Miksch performed her piece *Solstice*, using her voice and a digeridoo, the tape material was well elaborated, instead the performance was more an improvisation at a delay from the tape material. Surprisingly fresh, rather oldish in style, sounded the six very short noise studies under the title *Wushien* by Yu-Chung Tseng, very well managed by the composer at the mixing table. *Arioso/ Doubles* by Benjamin Broening for clarinet (Gerard Errante) was a very musical piece using excellent interaction between the player and the recorded material.

4th October Saturday Evening
John P. Young

The final concert of ICMC 2003 showcased an unusually diverse and consistently engaging array of works, focusing my attention despite the fact I was enraptured by the free self-illuminated pen provided by the conference organizers with which this text was written. The evening began with a crash and a whisper. But that was the sound of my head hitting the seat in front of me in a powerful foreshadowing of jet-lag to come, and subsequently the person sitting there admonishing me not to fall asleep--the concert hadn't even started yet. Perhaps I just succumbed to the warm embrace of the beautifully appointed venue, and five nights spent trying to keep up with my computer music elders, who always seem to possess the furious energy of the damned at these events (not to mention an astonishing tolerance for spirits). All this to give you a hint of my state of mind as I gave over all senses to the luminous spectacle appearing before me.

At first I thought perhaps the Muse herself had graced us with her incarnation, but blinking my eyes in wonder I soon recognized Maja Cerar gliding onto the stage, violin in hand as if she had been born the prodigal sister of John Henry. Bathed in otherworldly chromatic shades, she began Doug Geers' *Enkidu* with virtuosic trills, eliciting a shimmering metallic wash in response. Acoustic tone entering the machine in circular scales, clean then distorted. Melodic fragments. Electronics extending and elaborating the violin figures, evolving into heavy power chords distorting with echoed return of

spiral scales and trills, thematic significance unclear. Though the piece is inspired by the myth of Gilgamesh, exploring the psychological trajectory of Enkidu in his struggle with the will of the gods, a single hearing was not enough for me to sense any specific evocations thereof. Cerar's playing is consistently a joy to behold, but her location relatively far back on the stage denied us the full force of her presence. The violin part itself felt somewhat confined, and didn't tug me from my seat in the way that much of Geers' past work has. Perhaps these qualities were purposeful, part of the intended elucidation of character, but my high expectations were left somewhat unfulfilled. Pizzicati reflecting, rebounding, naive tune yielding to aggressive multi-stops, collapsing into a haltingly tentative melody over restless, foreboding bass.

As I pondered the similarities between *Enkidu* and Colin Powell, the hall suddenly plunged into darkness. Ah, my eyes had closed. Lost without the comforting glow of my magical pen, I opened them again, thus confusing my ears with superfluous data during the next tape piece, *Night Pulses* by Apostolos Loufopoulos. Rhythmic static, high sine drone, gong resonance scurrying. Electric jungle, rising harmonic overwhelmed by chirping patterns. Diminuendo to a single voice, static returns, more chaotic now, breaking in successive waves. Crickets. Background still beating harmonically, frequencies diverging into

deep resonance. Multiple layers distill to paired voices, one sustained, one pulsing. It was as if the Singapore of hundreds of years ago superimposed itself upon the present, an aural apparition of tropical organisms nibbling at the speaker wires. Please remember, I was heading towards twelve hours of electroacoustic music in the space of four days, like the Eco-Challenge without rescue helicopters--though most of us at least seemed to be keeping up with personal hygiene. I enjoyed the piece, if you need me to spell it out. Subtext, dear reader, subtext. Loufopoulos created a coherent soundworld and took us on an inventive journey amongst its denizens. Technically impeccable. Now if only my enchanted pen were filled with DEET.

Soprano Khor Ai Ming emerged in a long white flowing dress, a graceful apparition performing *Spiritus* by Paul Wilson. Synthetic and organic vocals begin in unison, then counterpoint with vast reverberation, smearing harmonics. Stuttering shh... ahh... glissando sweep to strained heights. Electronics veer away into modulating tones, ricochet consonants, growing pulse. Vowels, consonants blending. Zipper convergence. Reset. This piece was inspired by a photograph of a ghostly entity allegedly taken at England's Raynham Hall in 1936. More than two centuries previous, Dorothy Walpole, the Prime Minister's sister, died there of smallpox, after long imprisonment by her

husband for adultery. We can only hope she spent the intervening years kicking her abusive spouse's spectral ass. Noisy breathing. Gasps. Words? Vocables? Feeling I should understand the elusive speech. Emotional intimation inevitable, still incoherent. Intensified interplay, gestural counterpoint, building in volume and density, ringing bells, vocalist declaiming nonsense, singing in tongues, peaking then slow dissolve into silence. Performed a little over the edge, and rightly so, skillfully embodying the fervid temper of the disembodied. A striking and unsettling piece. Now if we only had the budget for those spooky Pirates of the Caribbean special effects. I'll put in a request for next year. Come on, we should be able to do that with Jitter on a G5, no problem.

What can I contribute about Russell Pinkston's *Gerrymander*, and the noble clarinetist Gerard Errante for whom the piece is named? I won't mention the technical difficulties suffered by these two veterans, nor Gerry's astounding tap solo and raucous impersonations of famous computer musicians (catch him at the Improv next week) in the meantime. Reboot and roll, as they say. Boom and rumble. Shake and sizzle. Seemingly incomplete clarinet gestures flowing into the next. Merging, dispersing into electronics which construct harmonies, coalesce into sustained backdrop. Boom. Insistent restlessness, handing off melody

to virtual percussion and back again. Building in strata towards shrillness, voices multiplying. Agitated percussion, melodies recap in settled diminuendo. Pinkston and Errante both seem to know how to dance that fine line between substance and spectacle, giving us something we can enjoy on many levels and not feel guilty about afterwards. I mean, how often does the word 'rollicking' occur to you at an ICMC concert? Not often enough, unless you happen to be sitting next to Cort Lippe. Bring it on, boys, can't wait for "G-mander Part Deux".

I have to admit, my favorite moment from the whole conference was seeing ICMA President and all-around role model Mary Simoni sit down to play one of the two pianos in *SlipstreamscapesLullaby* by Ivica Bukvic. It was a flash of instant nostalgia, like the breathlessness felt in childhood, a second before Mom opened her heart to croon a lilting embrace, transforming the whole world to peace and abiding tranquility. As Mary began to play, this remembered premonition was made manifest. A delicate third in the upper register slowly expanding, then detuning, reverberating, and returning to acoustic purity. Innocent rhythmic arpeggios, simultaneously static and dynamic. Then Ivica, on the other piano, enters with underpinning block chords. Electronics amplify and spiral detuned figures. Lush, gorgeous sonorities emerge, but are soon

submerged in random virtual pianolas. Wacky FM sweeps strafe through the soundfield. Half vinyl scratch, half surprised alien. Effects fade out, acoustic arps remain and dwindle away. Mom apparently forgot her medication and got a little out of control in the middle there, but all's well that ends well. Frankly, I'd pay money for an unplugged version, but as we're all supposed to be pushing the technological envelope, boldly going where no audience has gone before, blah blah blah, I suppose we can only mix our physical instruments on the virtual rocks. Too bad, because sometimes the acoustic parts are so eloquent that dilution is a travesty.

At intermission, I bounded out into the lobby, hoping for some play time with Margaret Schedel's installation *Corporealization Of Microphone*. Alas, it had mysteriously disappeared, perhaps to another dimension, leaving an inexplicable void where just the day before there had been 256 cubic feet of electroacoustic fun. CQ. CQ. This is W-9 GFO here. Come back.

Two tape pieces in a row after the break. Uh oh. Be strong, you can do this. Rikhardur Fridriksson gave us *Lidan II*, a new and improved version of 'an Icelandic word for the state of one's health.' Swirling extraterrestrial voices, annoyed. Static, anguished cries. Coughs. Lots of coughs.

Deconstructed. Ack. Spatialized and stretched. Pretty damn funny. Big delays, fusing into harmonic mass, perforated by hacking, yelling, and groaning, echo into subterranean chugging. Not exactly an encouraging advertisement for the Icelandic lifestyle. A vast untapped market for Robitussin and Triaminic? Was that exceptional diffusion or actual audience participation? Integration / disintegration of a single voice, redispersing into multiple timbral personalities. Hints at bitonal melodic gestures. Slapback echoes resolving to rich UFO landing thrum, cough becomes revving turbine launch, voices converge into noise. The little green men are here, and they desperately need Chloraseptic. The humor was more than welcome, a nod of thanks to the concert organizers as well as the composer for recognizing that levity is the fulcrum of genius, and after so many hours rooted to our seats, we could all enjoy a little levitation--minimizing any imminent threat of defenestration. That's in the ICMA bylaws, section 8.E.: 'Under no circumstances shall conference participants be permitted to exit a premises via windows, HVAC ducts, or other non-approved portals of egress.' You should really read those carefully, or risk running afoul of the ICMA Bylaw Compliance Task Force. They have amplification resources you can scarcely imagine, and that much sound focused on a single individual, well, let's just say biological FFT doesn't begin to describe the horror.

Moving on. Andreas Mähling's *Temple Days* provided the perfect material to completely trance out, and I mean that in a good way. Apparently the piece is based on layering repetitive rhythmic figures of differing periodicities, simple algorithmic rules yielding complex organic results. Bells. Outlining modal scale. Detuning, becoming wooden chimes, phasing unisons to arpeggios and back. Scalar xylophone, rotating and melting into square marching cadence, hammer-like, further into pitches with giant kettle drums, re-phasing. Eyes shut, head down, breathing slow and even. Ears attuned to nuance, short-circuiting sound to body. Hi-hats, vocals surfacing into melody, alternating feminine and masculine. Syncopated chords of electric piano into shrill chirps, chorale of pseudotext, increasing in density then withdrawing back into kettle drums, heartbeat against polyrhythm, pulsing with echoes. Bells reprise opening mode, and fade to equilibrium. Nice. If only I could have taken a recording with me for the week after my return home, when I kept bolting awake, ready to start my day at 2 AM. Seriously, it was supposed to be meditative, that was the point. It is accomplished.

And what did I witness next but a large orchestra, the Gamelan Asmaradana, assembling before us to perform *Ladrang Kampung* by Steve Everett. An excerpt from his two-hour intermedia shadow play "k

a M", described as a traditional setting of the Javanese cyclical form ladrang. Flute introduction, amplified with reverb, soon accompanied by slentem in parallel. Flute response, then full ensemble, gender and gong ageng, in thrilling cacophony. Rallentando led by flute, and resume. Hypnotic, both aurally and visually. Supposedly Kyma processing in there somewhere, but too subtle for me to distinguish. What I did notice was how ecstatic my ears felt to hear bona fide acoustic complexity, a riot of point sources across the entire stage sonically interacting with each other in continuous variation. Comforting to know we still have much work to do. I could have happily sat there for hours more, as long as the gamelan was willing to play, but alas it was over all too soon. and time to bid farewell to another ICMC.

Without warning, my nuclear-powered pen sprung to life, sketching madly on the back of my program. As I observed in astonishment, my bedevilled hand outlined a broad boulevard... lined with poles... no, foliage of some sort... could those be palm trees? Too exhausted to trifle with interpretation, I subdued the writing implement as it lost steam amidst a mess of illustrated marine creatures. Definitely have to save that thing for my next Pictionary competition. I chalked the hallucination up to PEAVD (Post Electro-Acoustic Vertiginous Disorder), crumpled

the program, and departed into the sultry Singaporean night. But, later, drifting into dream, a turtle on rollerblades, sporting mirrored shades, in the midst of a swamp (maybe the Everglades?) offered to rub lotion on my back, and that's where it fades. Probably just preemptive jet-lag again. Clearly should've stayed...

Interview Series

John Paul Young vs. John Fariselli Young

JPY) Let's start with some background —can you describe how you came to a career in computer music? (Please accept this term as broadly inclusive of acousmatic, electroacoustic, etc. —maybe we can debate aesthetic vs. functional definitions later. ;-) If you could choose any possible career in the world, would this be it? Did particular epiphanies or formative experiences play significant roles, or was it more a winnowing away of other pursuits as you focused and refined your path? Were there particular mentors or idols that motivated you? Did you seriously consider some other discipline or direction in life that would not have related to computer music at all?

JFY) I gravitated to computer music through the opportunity to work in studios as a student at university, though there is some background to that. I had the usual interests as a very small child playing records, some classical, but mostly singing along to the whatever pop music my older sisters were listening to (like the Beatles or Cat Stevens).

But when I was 11 my father bought a portable cassette recorder (it seemed quite common at that time for people to send spoken 'letters' to each other and we had had a few of those). I became fascinated by the process of recording and playing back sounds around me—including the voices of family and, of course, myself. I'd record stories and string together 'scenarios' of different sound sources into little productions, and try to 'punch in' edits to these. Something about the whole idea of sound as a slice of experience being recorded and listened to as a mirror of that experience is still a large part of what sustains me as a composer. At about the same time, I suddenly started hearing classical music in a new way—listening with an understanding to the textures, the lines, the shapes (I mean suddenly quite literally, since it was actually the playing of Eine Kleine Nachtmusik from another room that one day literally stopped me in my tracks)! From then on I just started buying and hiring classical records, trying to absorb as much as I could—took piano lessons, started playing the trumpet, and composing. In my high school years, I was a pretty standard 'muso', aware of electroacoustic music, since we were taught at school that there were some good New Zealand composers working in that field, but without much of a feeling that it was especially what I wanted to do. On finishing high school I had no idea other than studying music and started

at the music school in my hometown at the University of Canterbury. Something happened then that was very special for me ... there was a composer working there, John Cousins, who was using the process of sound recording, often of very mundane events, as material in compositions. That brought me right back to those earlier years playing around with the cassette recorder, and a kind of very openly creative experience with sound. It seemed so obvious to me that this should be integrated into a broader concept of music, that one could explore the realism of recording, as a 'document' of real-world events, and 'dramatise' that document with transformations that the studio made possible. There were people around, some faculty, other students who questioned this approach as 'music', but to me it seemed a natural bringing together of the widest world of sound. John Cousins continued to be a mentor for me as a student since, apart from the fact that I liked what he was composing, I responded strongly to his approach to teaching and encouraging creativity—essentially that musical ideas should not be solely a spin-off of technical possibilities or speaking through style/pastiche, but from a message or sentiment that the composer finds within themselves. That approach wasn't without difficulty, but it resonated powerfully with a lot of the values with which I was brought up.

JPY) As I understand it, you grew up (and lived until recently) in New Zealand. To many of us, New Zealand has a very mythic quality—a far-away island, steeped in natural beauty, with a rich and mysterious tribal past leading into the present—like an entire world unto itself. Do you feel that your music has been perceptibly influenced by those physical and/or cultural surroundings, literally or otherwise? Or, to look at it another way, what connections might you draw between your music and your environment? Feel free to correct any common misperceptions those of us on the other side of the planet might have... :-)

JFY) Well, daily life there is not much different from many other places... but maybe the distinctive thing about New Zealand's environment is the mixture of strong geographical features in a small area, as well as its relative remoteness by being surrounded by so much sea—to which one should add the cultural identity issues that inevitably arise in a post-colonial society. That has certainly been a significant influence on the artistic environment there, though I wouldn't say that the response to that condition has been uniform amongst artists. Electroacoustic music in New Zealand developed from a quite deliberate project to relate environment and music by Douglas Lilburn, who was New Zealand's pioneer in the medium in the early 1960s, remaining active until the end of the '70s.

His approach was a cultural/environmental one in the sense that he felt in an isolated country it could be possible to create a distinctive 'voice' by using new technology devoid of the 'resonances' of centuries of previous practice. But I think it also provided, for better or worse, a way for him to retreat from the particular process of musical iconoclasm and renewal that was still driving the avant-garde. So he turned to natural sounds and the theoretically 'blank' canvas of the synthesizer as it was then, finding a private space in which to do 'new' things. I felt Lilburn's influence not directly but through the composers he had taught in the '60s, and it was a very important part of my developing interest in electroacoustic music to appreciate that there were cultural, musical and emotive reasons to work with electroacoustic sound, not just purely technological ones. As I said, my interest was initiated by a certain feeling about sound recording and its expressive potential, and there continues to be a strong connection between environment and music for me. I don't think it's a definitively or deliberately 'New Zealand' sounding one, but maybe New Zealand was a convenient place for that sort of interest to grow. As a New Zealander, I'm first-generation. My father is English, but emigrated to New Zealand as a child, and my mother was from Italy (my father fought in WWII and they met in Italy in 1944, with my mother moving to New Zealand after the war).

I think this 'first generation-ness' and a separation from what I knew to be my real origins created for me a sort of cultural dislocation and distancing—family seen through war photographs and my parents memories of meeting being intertwined with momentous social experiences and political events. Ultimately, this sense of separation made me want to leave New Zealand. There is a powerful sense in which I feel more 'at home' in Europe and that's really what led me to move with my family to the UK (my wife is half Swedish, so the move closed a similar circle for her). But musically, while the process of composing has always involved using sounds drawn from my immediate environment, I feel that the artistic imperatives I've developed are also shared elsewhere, and the UK is a particularly sympathetic environment. There's an intensity and seriousness about electroacoustic music here and it's very exciting to be involved in that. It may be ironic that another composer to have influenced me greatly is Denis Smalley, a very important figure in the development of electroacoustic music in the UK, who was also born in New Zealand.

JPY) Ok, after two heavy questions, I'll pitch you a floater. What's your favorite sport... to watch? to play? to make fun of?

JFY) Cricket... especially international 'test' matches... five days long and room for drama, tension, boredom, and wonderful statistics.

JPY) Electroacoustic music is often thought of as very abstract, in the sense of not telling a 'story', or having any particular 'message'. Periodically at EA concerts I ask myself at the end of a piece, "what was the composer trying to say?" Most of the time I can't even begin to speculate (although a few beers beforehand seems to help). Sometimes I get a sense of reflection on the role of technology, sometimes samples are so distinctive (i.e. gunfire) that concrete associations of some sort are inevitable, and of course inclusions of text give the game away to the extent they call a whole other cognitive framework into play. The late Beethoven string quartets, Schoenberg piano works, and Webern's most austere twelve-tone compositions (to choose a few of the more challenging areas of the traditional repertoire) speak to me much more clearly by comparison, and I wonder at the reasons why.

JFY) Well, I often wonder too! The whole idea that, with electroacoustics, one can do 'anything'—make any sound, even (especially) ones previously 'unheard', sounds fantastic and has obviously been used since the early days as a kind of promotional tool for the 'new medium'. But of course, it's also quite problematic ... what do you do with an unlimited universe of possibilities? So perhaps part of the problem is that pieces often depart from an individual composer's particular relationship with some sounds and a set

of tools, and maybe that contributes to the feeling you express of 'messages' that are in some way not universal enough to be comprehended. I think from a personal standpoint I have taken one view—that sound recording has opened up the possibility of reflecting on the world we know, by capturing and re-projecting it, creating montage, etc. But it also gives access to the sound itself as a 'plastic' substance, as one of my doctoral students recently put it ... so that we can use transformation processes to explore the limits of recognition, hybrid identities, and so on. I guess I do think that, at some level, compositional intention should be 'clear' and that one should hear a personality, some substance, expressed with a degree of sophistication and even, if you like, 'guts' some risk-taking. But these things can't be manufactured. I think also that with EA/computer it is relatively easy for a composer to be seduced by the technology and solving an interesting technical challenge that doesn't necessarily have a strong musical outcome.

JPY) Earlier in the interview, you said that you are deeply engaged by the 'idea of sound as a slice of experience'. I think this is a powerful concept, but difficult to reconcile with the common practice of EA (in my view above). There are the musique concrete and soundscape efforts to construct tableaux so real you can taste, but I would contend these generally

relate to experience in the same way that snapshots relate to memories—they are profoundly evocative only if you were there. To continue the analogy, only rarely does such an EA work reach the level of a stunning photograph—transcending representation to achieve metaphor. Is this because of the tools, the gatekeepers, or is it just that hard to compose good computer music?

I'd like to hear your reactions and perspective to this gauntlet I've tried to throw down. I've made numerous assumptions, so feel free to take exception to any of them with the following in mind: Do you try to communicate with your audiences through the medium of music, in either literal or subtextual terms? Do you feel the success of your work depends in part on whether the audience interprets your 'message', or is it enough that they find the experience of listening valuable? Does the electroacoustic aesthetic discourage conscious communication? Are there limitations of the language of EA as you see it, and if so, how do you grapple with them?

JFY) Well, I'd say that only rarely does a photograph transcend representation too! I think the main thing is that sonic 'representation' of this kind is in itself extremely interesting since it enables us to think about what we can experience through our senses and memory. And although for

many of us it has become a natural part of what we do compositionally, it's still a musically radical idea. One of the tricky things about composing electroacoustically is getting to grips with 'thinking in sound' (to borrow from a well-known book)! The world of the EA composer is not just concerned with an imaginative 'inward' ear and score-based representation, but with this totality of electronically manufactured and extended sounds that may never have been heard before. As musicians, most of us have been trained to 'hear' in an inward way but, because this usually relates to note-based structures, it's not always that much help in, for example, the disassembly of timbres or complex digital processing. The immediacy of the studio environment compensates for that to a certain extent, but in terms of the way I work in the studio I find the compositional process to be quite a complicated mix of responding to the intrinsic qualities of sounds, and then trying to figure how to manipulate them in the way that is 'right' to my ear. I often find that a certain sound will provoke an 'imagined' response or extension to it that I am then faced with trying to create. On the other hand the potential to work with processes independently of the sounds themselves can throw up unexpected results—like a signal processing structure that is constructed before sounds are put into it, or one that is fashioned to process one particular sound and is then used to process different ones. This can nudge

me into another whole way of listening to the material and the wider musical context that I'm trying to create because, basically, I don't think it's always possible to predict exactly how something will sound in the studio and so sometimes it's useful to use that unpredictability and see what can happen. But for me the decisive step in the creative process is the listening response to the material with the aim of finding a context for it in the piece, or not. That in itself involves a lot of judgements made about the sounds, some informed, some intuitive, such as the apparent gestural directions of the sounds, the layers and complexity of the material and how they hold my attention over time, how a particular sound identity might be heard to develop or transform over time, and where I am 'steering' the focus of the music between notions of 'reality' and 'abstraction'. Having an aesthetic stance, from a sound and music point of view, is essential, and work that suggests an interest purely in the mechanics of its construction is problematic for me. When you said at the beginning you sometimes wonder "what was the composer trying to say?"—that is probably the crucially significant way of thinking, that the composer has, at their disposal, a platform for imparting a 'meaning'. Personally, I've no difficulty with such an assumption. As long as we care to ask that question, we are musically alive!

So, as I said, the use of natural recognizable sounds (whether 'sound-objects' or 'electroacoustic photographs') can function as a grounding for digital transformations/ synthesis—a reference that can be vicariously 'understood' and that for me is an important aspect of the conception and articulation of my pieces. For me the whole basis of composing extends from my feeling world and emotive reactions to things. But because a piece of music is finally going to need to stand on its own at some point, I think it's important to have some sort of objectivity—to be able to get the best understanding I can of the implications and requirements of the material in the most general sense possible. I genuinely want my pieces to be appreciated by the widest possible range of listeners, so I think I have a communicative imperative when I compose and I like to work with 'themes', 'sound images' and materials that have this base in the real world, which may relate to the listeners' lived experience in some way. Ideally, I think I do want listeners to have a sense of how I relate to the materials I use, but they find something for themselves too.

Ultimately I would like to think that if I touch a listener in some way, then that's what really matters, and if I can communicate something of the intense response I have to sounds, then I would feel that I've succeeded.

JPY) Do politics influence your music, overtly or otherwise? If so, please elaborate. If not, what is your perspective on the relationship between music and its social/cultural/political environment?

JFY) I think political thinking relates to my work so far only in the broadest sense—that I feel music has a social role and that its potential existence within a societal fabric is part of the motivation to do it in the first place. I relate to the idea of composing for 'myself and the hypothetical other', in which the core is having something to 'say' musically—so I'm not really into composing just to explore a technical possibility ... in the sense that first and foremost it has to work within a consistent frame of meaning for me, and that this will find a place in some wider context. In that respect the kinds of materials I work with (natural and recognisable sounds from the real world) have, I think, a grounding that might allow pieces to speak in some way to others. By projecting and manipulating familiar or ordinary things in new ways there's hopefully a common framework for reference and meaning. But I think music is an incredibly powerful vehicle for expressing need for social change, for protest or for reaction to social situations and I've huge admiration for artists who do that. Simple in surface structure as they are, the text-sound works of Ake Hodell fascinate me and, although it's overtly 'abstract', a work like Francis Dhomont's Lettre de Sarajevo cuts immediately to something very primal and powerful.

JPY) With the holidays either upon us or just around the corner, everyone is thinking about family. How do you interact musically with your wife and children? Is it an important part of your relationship or something you pursue mostly on your own? Do you expose them to EA, and if so, what do they appreciate about it (or not)? Are you hoping your children grow up to be musicians, will you encourage them towards something more (cough) practical, or do you let them find their own road?

JFY) My wife understands and appreciates what I do really well, she's an extremely good listener and, although she doesn't work in the arts (she's a doctor), she is interested in everything artistic. So I get good straight feedback from her if I need it, which is reasonably often! My two daughters are 6 and 3 and know that I'm an 'electroacoustic composer'! The eldest often reacts with me to sounds I'm working on at home often with a touch of humour. We had a lovely interaction on one occasion with some deeply transposed voice samples I was playing with that sounded like resonant drums, following and mimicking the sound with actions. Both of them react a lot to music, at the moment especially Tchaikovsky's ballets, and it supports a whole world of play that they live out. They're also very close to my

sister in London who runs a touring opera company so there's a theatrical influence there too. In general, I think I benefit from a generally supportive environment, but in which I ultimately get on with things mostly on my own. I would love it if my children did something artistic with their lives, but in the end they'll do whatever they want to—wherever their abilities take them. I'd never force them into anything.

CD Reviews

Natasha Barrett's *Isostasie*
empreintes DIGITALes
reviewed by
Maria Panayotova-Martin

The term 'isostasie' refers to a condition or state in which pressure is exerted upon an object from all sides and implies a sense of equilibrium. This is a very apt title for the recent CD compilation of electronic works by English composer Natasha Barrett, who has since relocated to Norway, reflecting the influence of "acousmatic" technique (from her work at the Birmingham Electroacoustic Studio Theatre) and the stark beauty of the glacier-cut Scandinavian landscape. Barrett creates a cascade of sounds that seem to surround the listener, swirling around the virtual space created in their mind through the use of spatialization techniques. Nevertheless, the force of this often startlingly direct approach is continually kept in check by the composer's diligent attention to equilibrium in both the individual pieces and the overall collection. She achieves this balance by carefully combining natural sound samples with electronically derived sounds, cacophonic surges of noise with meditative stillness and a constant consideration of the interplay of distance and familiarity in the handling of her sound material.

The first piece on Isostasie is called *Fictions (Northern Mix)* and is divided into three smaller pieces, each of them having a different subtitle referring to nature: (Track 1) In the Rain, (Track 2) Midnight Sun:Midday Moon and (Track3) Outside Snow Falls. All the above share a specific sound world created using mostly concrete sounds from different and opposing natural environments. Presented in combination they form a unique style and show a different personal perspective on the world we live in because of the choice, placement and manipulation of sonic material.

The first subsection called "In the rain" makes use of, as we would expect, rain samples. The background of a weather environment is punctuated by close-up spatializations of the sounds of breathing and almost glissandi-like abstract sounds increasing in density. This culminates in almost pure tones, either chimes, birds or whistles and in a more meditative, low density and hushed volume. "Midnight Sun: Midday moon" opens with a crash of sound and more pronounced reverberation effects. It uses verbalizations, hard consonants and ominous howling, mixed with the concrete sounds of rustling and spoken voice, from which we catch bits of the title, such as the word "Midday."

These fragments of speech are cast against a scenery of mostly natural sounds, which are not processed, but mostly reverberated to add depth and combined with an added layer of what sounds like electronically derived sine waves. Natasha Barrett works with spatialization to create paths of movement for the faster moving sound objects, which is not only an effect of panning, but the simulation of depth based on the reverb techniques. The result is that the displaced voice becomes more unreal because of the creation of an unreal reality in which it is located. "Outside snow falls" presents an array of concrete sounds including footsteps, a cat's meow and cat food falling into a porcelain bowl, transporting the listener into the domestic scene of a kitchen interior, while the weather remains outside. The natural rhythms of everyday actions are juxtaposed against reverberated sounds of banging metal objects. These sounds transition to electronic clicks and whistles swimming on the surface, eventually floating into a gentle, interwoven suspended canon.

Displaced:replaced (Tracks 4,6 and 8) is the largest musical form on Isostasie because it connects a triptych of brief episodes that serve as interludes to the longer sections (Tracks 5 and 7) in between them. The first of these interludes is called "Fog, light wind", the second is "Wet and gusty" and the last one is "Gathering wind". The weather metaphor surfaces again in the ambient curtain of atmospheric sounds in each of these tracks forming a mental link among them. In "Fog, light wind" Barrett uses concrete sounds in their natural rhythms, but rearranges them in new ways in the mixing process to create a personal musical landscape. Sounds from nature are used like building blocks, shaped and overlapped in varied rhythms and patterns to form this unique sound picture. Track 6 "Wet and gusty" employs different kinds of water sounds in a manner similar to the above technique, where the difference in their natural speeds is made more alive and real by panning them in opposite directions. Track 8 "Gathering wind" features filtered, reverberated wind mixed with dry crackles of the filtered high frequencies. These are familiar sounds which are sometimes processed very little, but undergo an alienation effect because they are used in an unfamiliar context.

Red Snow (Track 5) presents the dry sound of crunching snow as if someone were stepping on it or shoveling it. It also includes a tapestry of reverbed filtered noises, where some pitches come to the surface because of the filtering technique. The composer brings to the foreground certain elements through amplitude and panning creating an almost narrative function. We also have our first silences, followed by metallic pitched sounds, adding in and moving at different speeds. Some of them are repeating so fast that it seems like they are rolling which works well with the panning.

Track 7, *Viva la Sselva* (Long live the jungle) presents to us insect and animal sounds at night, such as cicadas regular rhythms and reverberated dogs barking. There is an interplay of heavily processed, fast-moving sounds panning in and out of the picture, like moths flitting around a porch light. Gradually the piece transitions into the low and almost sleepy rhythm of gentle sounds against the steady pulse of a cricket and the striated sounds of beating of insect wings. Whistles in the background, like breezes slowly stirring, are punctuated with the sounds of birds that range from whistles to clicks and are overlapped with insect rhythms and even the hum of a mosquito zooming in and out of earshot. The sounds gradually become more exotic and it becomes clear that we are in a jungle setting. These abundant layers of detail are arranged into an organic whole. The crux of the piece occurs when a sample of classical music is presented, like a radio in the wilderness, followed by a collection of voice samples which are formed into their own rhythmic patterns, possibly representing a convolution of human voice with insect rhythms. At this point the range of representation expands to include eerie, outer-space like sounds so that one could envision an entire universe from the smallest animals to man to the unearthly, extraterrestrial sounds of space. The overall effect is very visual and moves through a large natural territory closing again in the immediate sounds of a forest, as if one was walking alone.

Track 9, *The Utility of Space* picks up with crackling sounds and voice murmuring the word "space," ghostly against a concrete soundscape outside where we hear an airplane passing. Voice is highly fragmented into mere phonemes, yet still presented in the rhythm of speech so that one wishes to fill in the gaps, completing the sounds and words to "read" the sentence. There is not just a breakdown of syntax, but a complete fragmentation of the phonetic structure of words, resulting in crumbles of speech. Church bells ringing in the background ring and resonate to create their own pulse. They are extended and layered with processed speech and other rhythmic natural sounds such as wind, birds chirping and wave sounds swirling through the sound space in different concentrations and densities. At this point the music evolves into a stage of silence through which various filtered sounds used in previous tracks, such as the snow crunching, move through by means of panning and spatialization. The music turns steadily more abstract as the soundscape becomes crowded with heavily processed and filtered sounds. The repetition of bird sounds and the voice saying "space" is now entirely abstracted, sans the natural soundscape in the background. The use of these soundscape elements, including voice and the airplane sample, which returns at the very end, evokes a sense of presence without being overwhelming because they are taken out

of their naturalistic, narrative soundscape and abstracted into independent sound elements which are employed like musical instruments.

Track 10, *Industrial Revelations* begins with a crash of sounds and heavier, more mechanical rhythms reminding us of those from an industrial machine. After a slight pause the composer begins to draw out individual sounds and create groupings that swell in intensity and the density of metallic squeals, rhythmic clangs and the sound of steam being released. There are a˙ series of these cells and again the use of lightly processed voice is present in a fragmented laugh or a brief interlude of distorted singing, screaming or speech. Overall this track serves as a conclusion for the entire collection of pieces by readdressing the relationship of humankind, nature and technology. Natasha Barrett's Isostasie mingles these sound worlds so that the audience experiences sounds anew, exploring them in a virtual space, which although it threatens at times to overwhelm the listener with pressures and intensities from all sides, never does so entirely because that space is thoroughly composed and the treatment of concrete/abstract sounds always remains musical.

Eric Chasalow's
Left to His Own Devices
New World Records
reviewed by Ivica Ico Bukvic

The 20th century has now closed its doors and we have plunged into a new era of uncertain eclecticism. Yet, regardless of the newly-established historical status of the past 100 years, we are still hard-pressed to condense the elapsed time and the artistic innovations it brought in a coherent and unifying fashion. Perhaps the only apparent thread that permeates throughout the last century is the continuous effort of timbral emancipation, for which the stage was set through Schoenberg's breakaway from tonality, maturing of the percussion choir heralded through the works of Varese and Stravinsky, experimentation with new timbres foreshadowed by the Italian Futurists, as well as Cage's questioning of sound, silence, and structure, but perhaps most importantly through the efforts of the electro-acoustic music composers and researchers.

At the beginning of this new 21st century we are finally ready to accept timbre as an equal partner to the other musical elements which have constituted the backbone of the traditional Western music for centuries. In such environment, the music that is not any more concerned with existentialism and validation, but rather art itself can finally flourish. In such environment we are finally free to combine our traditional notions with our newly-acquired technological prowess and seemingly endless timbral diversity. In such environment we are at last free to write music the way we want to, mixing styles and media without being hindered by the political and traditional aesthetic boundaries.

Of course, I am perhaps overly optimistic in my view of the current state of affairs in the ever-changing torrent of the contemporary arts scene. Nonetheless, the fact that nowadays we see more of such stylistic and instrumental cross-breeding than ever before is certainly difficult to contest. In this ever-changing current we, the artists, struggle to stay afloat. In this struggle, some of us happen to be the followers, slowly adapting to the trends of our times and/or expanding the paths that have been set before us. Others are the ones who lead, the ones who foreshadow the things that are to come.

Eric Chasalow's CD *Left to His Own Devices*, clearly establishes him as one of the leaders of our times. Most of the works on the disc predate this century, yet offer a wondrous fusion between distinct styles and mediums, nullifying many of the preconceived limitations and/or political borders beset by the ongoing struggle to recognize electro-acoustic art as an equal to the tradition-abundant world of acoustic music. In addition, the polarities between the works themselves reveal Chasalow's skillfulness in both the electronic and acoustic realm. Hence, one by listening will be exposed to the complexity of Babbitt, timbral integration of Davidovsky, the colorful spectra of jazz idiom, wit and skill of Beethoven and Brahms, improvisatory power of Miles Davis, with a few sprinkles of John Cage and Elliott Carter on top.

The CD offers 9 distinct works, some of which are multi-movement endeavors. Rather than supplying an exhaustive journey from cover to cover, I will opt to entice you with just a couple of Chasalow's masterful creations that I personally found to be the most captivating, and hopefully in the process of doing so intrigue your musical taste buds strongly enough to make you explore the rest of the works under your own initiative. The first track on the CD, *In a Manner of Speaking*, opens up dramatically with a morphed sound of a clarinet that closely resembles an aboriginal didgeridoo and then quickly dissolves into its primal form. From there on, the piece quickly expands into a texture that bears strong resemblance to Davidovsky's *Synchronisms* series with the quasi-pointillistic incursions of both the acoustic and electronic counterparts. In this colorful conversation between the "real" and "fantastic," both the tape and clarinet coexist in a struggle to maintain timbral, textural, and rhythmic balance. Amidst the sea of colorful but relatively short phrases a texture surfaces, captivating listener's

attention through perpetual introduction of new sonic flavors, many of which bear associations with the real-world sonic phenomena. As such, we are exposed to sounds of vintage synths, meta-banjos, and various other pitched, but largely timbrally undefinable sounds. The resulting textural richness certainly exhibits the technological gap that separates Davidovsky's endeavors of the 60's and 70's and Mr. Chasalow's creation that was written right before the turn of the 21st century. Yet, the sonic palette remains true to its predecessor and the composer manages to generate a sound that is neither plagued by the technological poverty of the mid-20th century, nor the over-saturation of our digital age. Perhaps the only gripe that I could associate with this work is its brevity, as I could have certainly enjoyed a longer work. On the other hand, such attribute can also be seen as a compliment to the author's modesty, rather than a sign of a frail design (something that, in my humble opinion, we ought to see a lot more, especially on the various conferences that are populated with marathon-like concert programs).

Yes, I Really Did, composed in 1998 populates the second place on the CD and bears a unique contrasting aesthetic to just about every other work in the collection. Not only is its medium completely acoustic, but even more so its aesthetics is built upon the *Common Practice* tradition, exhibiting influences of great historical figures such as

Beethoven and Brahms. This piano trio is a warped reflection upon the past, as if the composer took a concave looking glass in an effort to read one of the early Romantic chamber works. Musical phrases and gestures boasting a relatively traditional architectural design of substantial rhythmic regularity, continuously infuse the overall texture, but they do so lacking one of the critical *Common Practice* elements — a tonal center. Chasalow utilizes evasive harmonic motions in order to avoid tonal implications, therefore generating a sound that closely resembles a piece from the Schoenberg's atonal period (albeit disregarding the Schoenberg's vigorous pursuit of avoiding even the feeblest hints of tonality, such as octave doublings). Composer's prowess with the traditional manipulation of the material truly shines in this single-movement work. The exchange of ideas among the players is suggestive of a meaningful introductory conversation that soon plunges into an energetic superimposition of pulse-driven ideas. However, despite the obvious allusions to the things past, Chasalow manages to overshadow the apparent influences with his own compositional character. It is also impressive to notice that the work exhibits none of the contemporary performance techniques as well as utilizes the oft-treaded post-Modern approach, yet nonetheless, sounds fresh and appealing.

Dream Songs is an ambitious five-movement work for tape (posing as a tenor solo) and

orchestra, commissioned by the Boston Modern Orchestra Project. If I had to describe it in one sentence, I would say that it is as if you took Stockhausen's *Gesang der Junglinge* and mixed it with the late 20th century post-tonal orchestral idiom, resulting in a Mahler-like orchestral Lied of the 21st century. An amazing balance between the vocals and the orchestra dominates the work. Chasalow manages to exhibit yet another one of his talents through masterful orchestration coupled with a convincing tape counterpart. Through author's masterful hands, both the acoustic and electro-acoustic worlds are merged together resulting in a convincing and structurally sane work of a mass appeal. All five movements, although somewhat different in their character, convey the same restless mood that is in part driven by the poetry contained in the tape part. This comes as no surprise as Chasalow used five poems from the same-titled collection written by John Berryman. Although personally I am not a big fan of the *sprechstimme* and/or other semideclamatory text interpretations and incantations, in this case such treatment seems to work rather well, in part due to masterfully processed tape snippets that shroud the text and its respective vocalizations. The composer's boldness is apparent in his superimposition of a powerful sound of the traditional orchestra and the rich timbral possibilities of the electro-acoustic medium. Naturally,

orchestra predominantly resides in the realm of soft dynamics in order to ensure the legibility of the text. Even so, the piece is an impressive endeavor in every aspect and is probably one of my favorite works on the CD.

Finally, what would this review be without touching upon the piece the whole collection was titled after? *Left to His Own Devices* is an old-school electro-acoustic piece with subtle processing of the Milton Babbitt's voice and various organ-like sounds that appear to be simple extrapolations of the FM and AM syntheses, mimicking Babbitt's now defunct RCA synthesizer. Most of the processing involves pitch-bending without resampling, some sound-stretching, as well as generation of nebulae of pitched material. In that respect, the piece attempts to retain the character of the times when Babbitt's infatuation with the RCA synthesizer was at its peak. Perhaps the most captivating aspect of the work is its micro-programmatic treatment of the text, as well as the overall storyline that in part appears to be Babbitt's semi-autobiographical journey. Several quotes of Babbitt's instrumental music filter through the work disguised in the Chasalow's synthetic interpretation. The piece also consciously reflects upon the Babbitt's last work utilizing RCA synthesizer that he never managed to finish due to unfortunate defacement of the expensive machine by unknown vandal(s).

Composer's attention to intricate details in an attempt to recreate the RCA synthesizer, coupled by the subtle processing of the material yet once more speak of both his strong grasp of the technology as well as its tasteful deployment.

Many other remarkable works are a part of this collection, such as the *Suspicious Motives* with its intricate balance between the timbrally-rich chamber ensemble and tape, *Crossing Boundaries* that sonically resembles *Left to His Own Devices* while encompassing a much broader subject, *In the Works* as yet another purely acoustic work with a contemporary jazz-like aesthetics, as well as *Out of Joint* improvisatory piece for trumpet and tape, and *And It Flew Upside Down* that pays yet once more a tribute to both Davidovsky and Babbitt. The richness of the medium as well as styles offered herein consequently leaves something for every musical taste to appreciate. As such, *Left to His Own Devices* is a successful forward-looking compendium of Chasalow's creations that boldly integrates the combination of the traditional acoustic music idiom and the modern electro-acoustic art.

Elizabeth McNutt's *Pipe Wrench*
EMF Media
reviewed by *Robert Denham*

Pipe Wrench: flute + computer, an innovative new CD featuring new music specialist Elizabeth McNutt, is a must-listen new release from the Electronic Music Foundation label. McNutt, a veteran performer of interactive music, is brilliant with impeccable interpretations of five pieces written within the last twenty years. One of the remarkable characteristics of the CD as a whole is how McNutt manages to infuse each work with a depth of meaning and purpose that can only come from an intimate understanding of the scores and the genre of interactive computer music performance as a whole.

McNutt is able to shape the sound of her own instrument to compliment the synthetically generated timbres around her; the range of her expression is a natural match for the timbral variety of computer music. This, coupled with a high level of virtuosity across the range of the instrument, allows her to get inside the computer program and manipulate it, one of the unspoken performance goals of every interactive composition. Her program choice is excellent, and represents an intelligent blend of profundity, brevity, and levity with pieces written between 1987 and 1996.

The first piece on the CD is *The Twittering Machine* (1995) by Andrew May. May wrote this piece in collaboration with McNutt, and it serves as a wonderful opener since it plunges the listener directly into an atmosphere where acoustic and electronic sounds are melded. "Melding" is an especially appropriate description, since the computer is primarily used to subtly alter sounds that are physically produced by both McNutt and her flute. These sounds produce the "twitters" (the title is taken from a painting by Paul Klee), which become the focus of the piece as they eventually envelope the flute in a constantly morphing canopy of sound. The other birds, seemingly the computer generated offspring of the original, take on many forms (clicking, murmuring, pulsing) and serve as a constantly morphing background. Though the twitters continue in various forms for nearly the entire piece, the work has a strong sense of direction; an overall arch that yields a great sense of satisfaction to the listener.

Cort Lippe's *Music for Flute and Computer* (1994) allows McNutt to display her skill in improvisation. As with much of Lippe's music, the focus of the piece is more about timbre than form, specifically in how the color of the flute reacts with various colors generated by the computer. The computer rarely usurps the central role of the flute, and generally takes on a subservient role as it tracks the live performer's melodic line

and responds to certain predetermined events. Lippe states that "The work has elements of both a solo and a duo: at times the computer part cannot be separated from the flute part, while in other instances the computer has its own independent musical function." The piece is generally effective in achieving this goal, though it might be argued that the flute's role is too central or that the computer is not given an opportunity to really show its worth as a solo instrument. However, if this is a shortcoming, it is not enough to significantly detract from Lippe's distinct compositional voice.

A refreshing change of pace comes with the CD's third piece, Eric Lyon's *The Blistering Price of Power* (1993). This work provides a humorous counterbalance to the meditative qualities of Lippe's music by virtue of its levity, "spiritual understanding," and its limited role for the flute. If this last statement seems peculiar, suffice it to say that the piece operates much in the same manner as John Cage's *Radio Music;* at times a station featuring the flute is present, but this alternates with any one of a number of flute-less stations that might take full command of the airwaves. These channels are only juxtaposed near the end of the work, which means that the flute is absent from the texture for at least as much time as it is present. Despite the fact that the flute's character remains relatively unchanged throughout the course of the

work, the abrupt shifts in texture along with the frequent electronic solos allow the acoustic instrument to retain its freshness and vitality.

Barry Moon's *Interact 1* (1996) is essentially guided by the performance-time decisions of the flutist. As such, the work takes on a meandering quality that may give the impression of a lack of formal clarity. However, this sense of wandering is really the point of the piece, since it allows the listener to revel in the richness of the sounds resulting from McNutt's decisions. If the listener can realize this, he/she will no longer experience the nagging question "where is this piece going?" but will instead experience a state of anticipation, as if to ask "what comes next?!" It is true that the structure of this piece may not be easily grasped by classically trained ears, but it is equally true that once the purpose of the piece is exposed it yields a fascinating exposé of sounds and textures. Some of these are quite distinct from the flute, while others are dependent on its timbre (severe pitch warping, timbral distortions, echoes, etc.). One sound in particular, which Moon uses near the beginning of his piece, thickens the character of the multiphonics McNutt plays, thereby allowing her to activate a choral texture. The electronic sound serves to expand the character of the multiphonic, showing an understanding of both flute writing and computer programming. All of the

sounds share the common purpose of responding at various levels of intensity to the musicality of the performer.

In contrast, Philippe Manoury's *Jupiter* (1987) displays an excellent balance of color preservation and formal clarity. Both of these factors are essential to the success of this work, since its monumental length of 28 minutes sets it apart from the four shorter works on the program. In terms of color, it is true that the flute dominates the texture, but it is countered with a reasonably limited palette of computer generated sounds, like washes of color punctuated by synthesized bells. These tend to be more gentle and soothing than the computer timbres found in the other four pieces on the CD. In this way, the flute is not overwhelmed by the infinite variety of the electronics, which by virtue of their limitations enable the listener to have a greater sense of memorability and recognition. Manoury is able to use the submission and withdrawal of specific timbres to clarify the work's formal structure (as was purposefully lacking in the Moon). He uses these features to give the listener a helpful, but in no way condescending, guide as to the destination of the work. This sense of direction, along with McNutt's skillful interpretation, gives the work a depth and profundity that would not have otherwise been possible.

Manoury's work provides the strong finish that *Pipewrench: flute + computer* deserves. In addition to McNutt's stellar performances and scrupulous attention to detail, all five pieces on the disk are worthy of serious contemplation. All of them treat the subject of interaction from a slightly different perspective; from May's chattering dialogue, to Lyon's humorous contrasts, to Moon's use of musical dialogue and wandering lines. I fully recommend this recording as McNutt's triumphant realization of five works from the very recent past, any one of which may with time prove to be a masterpiece of the interactive genre.

Book Reviews

**Emily Thompson: *The Soundscape
of Modernity*
MIT Press
*Reviewed by Barry Truax***

Emily Thompson's book, *The Soundscape of Modernity*, is a major contribution to the growing literature on aural culture, several examples of which have been reviewed in this journal. In this new work, Thompson focuses on what is arguably the period of greatest significance to the emergence of the modern listener, America from 1900 to 1933. The changes in the science and practice of acoustics, the emergence of electroacoustic technology and audio media, and the rise of noise levels in major cities heralded contradictory cultural changes, the implications of which we are still dealing with today.

Thompson, an Assistant Professor of History and Sociology of Science at the University of Pennsylvania, demonstrates how that history should be documented, not merely as technical progress but in terms of the social and cultural context which it inevitably alters. She refreshingly makes the

argument that it is not only the soundscape that changes, but listeners change as well. "By 1933," she observes, "both the nature of sound and the culture of listening were unlike anything that had come before." Thompson's approach, though based in the history of architecture and architectural acoustics, is interdisciplinary in that, for the first time, she brings together three themes that in the past have been dealt with as separate histories.

First there is the rise of the modern science of acoustics, starting with the pioneering work of Wallace Sabine in the 1890s and early 1900s, which gave a scientific basis for the design of concert halls, auditoria and offices by controlling excessive reverberation with acoustically treated materials. Even as the public became exposed to the orderly sound of these acoustically designed spaces, the external environment, particularly in large cities, was being inundated with mechanical noise and other irritants, Thompson's second theme. New York City responded to this situation by appointing a Noise Abatement Commission whose 1930 report, *City Noise*, was the first such public document. The third theme, possibly having the greatest implication for the listener, is the phenomenal rise of reproduced and transmitted sound via electroacoustic technology. Amplification, radio, the sound film and recordings all appeared during this period and changed listening habits and

preferences. Thompson adroitly frames this period of profound change with the opening of Wallace Sabine's acoustically designed Boston Symphony Hall in 1900 —a building looking backwards to the classical music of the 19th century—and the opening of Radio City Music Hall in New York in 1932, an acoustically deadened space that relied on amplified sound to promote the new, popular culture of the 20th century.

One hopes that Thompson's approach to writing will become the norm among a younger generation of academics. She has an engaging narrative style, complete with telling insights into the personalities involved, particularly Sabine's, but her research and documentation are impeccably detailed. Moreover, she has a set of themes that she weaves throughout the narrative, connecting threads that give meaning to the wealth of detail, which often are technical but never dry or unduly simplified. Perhaps the clearest theme is the advent of a new kind of aural preference for clear, direct, non-reverberant sound and the critical listening habits that it encouraged. This theme makes sense of the progression from the control of reverberation by Sabine's famous formula based on the absorptive properties of materials in a room to the disembodied audio signal picked up by close miking that eliminated space entirely. The control of acoustic space ultimately becomes a

separation of sound from space, a signal that can then be reproduced in any other time and space.

This control of the largely indoor environment (linked to artificial lighting and ventilation) was in keeping with the ethic of "efficiency" in the modern Machine Age. As such, it was the antithesis of noise that came to be regarded as wasted energy, as well as a physical and psychological danger. Thompson carefully documents the stages of the technical mastery of sound, the most important being the ability to measure sound, thus surmounting the major obstacle to the development of acoustics as a science in the early 1900s. The microphone and amplifier, famous for their media usage, were key elements in the measurement of sound, allowing the creation of the decibel scale. It is this technical divide that separated the acoustics of Wallace Sabine from the "new acousticians" who exploited the new technology and founded the Acoustical Society of America in the 1920s. They also used this technology to tackle the more intractable problem of urban noise, but with less success. The earliest measurements were based on a curious combination of calibrated signals (produced by machines carried around the city in a truck) judged subjectively by a listener who compared them to the street noise. This approach became standardized in the next decade as the Equal Loudness

Contours, the foundation of modern psychoacoustics.

A fascinating section of the book is devoted to noise and modern music during this period, specifically jazz, Russolo and the Futurists, Ives, Varèse, and Antheil. Besides documenting how the new technological noises invaded and influenced the music of these composers, Thompson includes intriguing accounts of how the experience of that music changed at least certain listeners' reactions to the city noises they heard following the event. As music critic Paul Rosenfeld described it in highly modern prose, "You walk, ride, fly through a world of steel and glass and concrete, by rasping, blasting, threatening machinery become strangely humanized and fraternal; yourself freshly receptive and good-humoured"—clearly a vanished breed of critic. Although Thompson makes passing reference to Thaddeus Cahill's Telharmonium as a modern musical instrument, she misses the opportunity to document its use in providing what we now call background music in upscale restaurants in New York during this period, the perfect antithesis to the city's noise and a good example of the appearance of disembodied sound in the new soundscape; however, we can turn to Reynold Weidenaar's 1995 book for those insights.

In the final two chapters, Thompson turns to the most profound of all of the aural changes brought about by modernism – the impact of audio technology. The possibility of sound reproduction brings with it, among other things, a new type of "critical listener", as Thompson terms it, or "analytical listening" as I've described it (Truax, 2001), whose task is to discern the quality of reproduction and obtain the best possible sound, a process of education that the audio industry pursues to this day. Radio, recording and the sound film eventually settled on close miking to produce the clearest sound within an acoustically isolated studio, with the mixing engineer in charge of combining sounds for the clearest result. Thompson returns to her principal architectural concerns as a conclusion and documents the trend in the 1920s and 30s towards theatres with shorter reverberation times, aided by amplified reinforcement to achieve a type of sound the audience had become used to hearing via electrical recording. Thus we arrive at the detached listener, able to listen critically and analytically to reproduced sound as an escape from the disorderly soundscape; all that is needed is to add the ubiquitous presence of background music to create the distracted listener, and we have all of the essential elements of contemporary aural culture.

In tracing this crucial set of intertwined developments, Emily Thompson has created a seminal book that sets a standard for interdisciplinary research in acoustic communication. The fact that it grounds contemporary aural culture makes it indispensable for understanding our own ambivalent attitudes about the soundscape and technology.

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