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From the Editor

There is little doubt that electro-acoustic music has witnessed tremendous growth, development, and maturation since its humble beginnings in the 1940s and 1950s. From the very early stages of its birth, composers, musicians, engineers, scientists, and educators have collectively contributed in a plethora of ways in pushing this "genre" forward; and many early electro-acoustic music "pioneers" still are actively engaged and involved in the field today. One such active participant and pioneer was Paul Lansky: one day, he decided to drop the *electro* part of *electro-acoustic music* and focus only on acoustic music after 40 years of primarily composing with and for electronic media. To be sure, although this was a surprise for many of his colleagues, friends, and students alike, it was, at the same time, not that much of a surprise for others, as he always seemed love to be challenged musically, technically, and intellectually. In light of Lansky's seemingly abrupt departure from the electro-acoustic music world, we have collected a number of articles for Volume 23 which include his "valedictorian" keynote speech at the 2009 International Computer Music Conference (ICMC) at McGill University, an article by Brent Reidy exploring Lansky's music and aesthetics from a "hermeneutic" perspective, and an interview conducted via email over a number of months. Some readers will likely never "forgive" Paul Lansky for abandoning the machine – he has seemingly "... caught quite a bit of 'flak' in the blogosphere ..." for a "manifesto article" that was published in the New York Times in August 2008 - while others will opine that "... it's no big deal ..." wondering what all the "... fuss is about." Regardless of the idle or non-idle chatter at conferences, receptions, blogospheres, social media sites, classrooms, and email inboxes, it is our hope that the articles in Volume 23, together, will hopefully offer somewhat of a retrospective journey revisiting many Paul Lansky's electro-acoustic music contributions while at the same time provide content and context to his new adventures in the land of the unplugged.

As is customary for Journal SEAMUS, Volume 23 includes a number of event reviews from various places including from Atlanta, North Dakota, New Orleans, and Ljubljana, Slovenia. This includes a computer music concert at Georgia State University featuring student/faculty works with guest composer Jon Appleton, a concert featuring the music of Irish composer and vocalist Jennifer Walshe, the 2011 EarZoom Sonic Arts Festival where a number of our SEAMUS members attended and presented their works, the 2011 iteration of the Margaret Guthman Instrument Competition hosted at Georgia Institute of Technology, and a review of the New Music New Orleans concert hosted by composer Paul Botelho at Loyola University.

Also included in our journal are reviews of a recently published book by Larry Austin and Douglas Kahn entitled *Source: Music of the Avant Garde 1966-1973* and a CD review of composer Robert Scott Thompson's *Elemental*, written by Steven Propp.

Finally, as per our efforts started in 2010, in this iteration of *Tips and Tricks*, we introduce the JUCE programming environment that allows for remarkably quick and easy development of cross-platform audio software.

As always, please feel free to contact our team for any questions, comments, and concerns. Enjoy!

Tae Hong Park, Editor

Paul Lansky

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International Computer Music Conference 2009 Montreal, Canada, 8/19/2009

From the circumstances it would appear that this is supposed to be a valedictory speech, and I think it probably is. About two or three years ago, after spending nearly forty years doing little but computer music, I found myself doing none, and came to the realization that as a senior I had probably changed my major. At any rate, I had reached a point where I felt that I had finished one thing and started another. The plain truth is that I just wanted to do something new and different, something for which I needed new skills and computer music no longer filled that bill. Gary Scavone's invitation to me to give this keynote came about because of a New York Times (8/03/2008) article last August that itself was a result of some liner notes I had written for a CD of instrumental music I issued in 2007 (Etudes and Parodies, Bridge Records CD 9222) in which I described a backwards journey of a sort. In it I said, "At an age when most young composers are learning ... the difference between sul pont and sul tasto, I was ... learning ... to scale the output of a two-pole feedback filter in Fortran IV, ... and when I looked up I was no longer a young composer." I went on to say that now I'm at an age where I once more can get into the movies cheaply and I find myself in the shoes of a young composer, learning the intricacies of preparing an orchestra score and similar things I would have learned forty years earlier had I not turned down that particular avenue. The Times writer, Dan Wakin said my liner notes read like a manifesto, which was not my intention. But, who can resist a feature article in the Arts and Leisure section of the Sunday New York Times, so I agreed to submit to an interview. In my conversations with Wakin I confessed that I wasn't a big fan of "electronic" music and took some trouble to

explain that the beauty of the computer was that it could rise above any particular genre. This got elided in the published interview and I caught quite a bit of "flak" in the blogosphere where the general response to the article was interesting. My favorite was something like "Next time I make an aesthetic decision, remind me to hold a press conference." Other reactions were a little Typical was, "well, I do both subtler. instrumental and electronic music, it's no big deal and I don't see what the fuss is about." Well, we each have our own way of working and in my case I find that I am not good at multitasking. It's in my nature to take control and (metaphorically) design the cars I drive, which led me to write Cmix, RT, and a few other software tools that I used heavily for many vears. This added a lot of time to the compositional process. But the fact remains that for about 40 years I spent ninety percent of my composing energy working with computers, produced a large body of work, of which I'm proud, and then well into my 60's found myself leaving this exciting arena for other pastures. So I suppose this is a valedictory speech. This is the twenty-third ICMC I've attended and I'm ostensibly here to say goodbye and offer some wisdom. I can't help feeling a small pang over all the time I spent developing extensive skills I may no longer use, but I console myself with the realization that I put it all to good use, and that a newer generation has a whole new toolkit that I would have to learn were I to stay current. I won't say that I'll never do any more computer music, although it seems unlikely. (One of my friends guipped that if I did return I might get another featured Times article.)

It's interesting to note that exactly twenty years ago I gave the keynote at the ICMC in

Ohio State, where I rigged up an interactive piece that reshaped my speech into music using Roger Dannenberg's MIDI ToolKit, an IVL Pitchrider and a Yamaha TX816. I said that if the audience wasn't interested in what I was saying, they could listen instead to the music of what I'm saying. At this point I forgot what I said (knowing Roger I'm sure that CMT is still available, but I can't find the text of my talk). All I remember is that we had some problems with the Yamaha. It certainly wasn't a valedictory speech and it probably wasn't very interesting and consisted of future-gazing about unlimited possibilities for music thanks to new technologies. But that was another day.

What I would like to talk about today, however, are my perspectives on the developments in digital technology over this forty year span, not from a "gee-whiz isn't it great what we can do now that we couldn't do then" point of view but rather from a perspective positioned on a table of musical concerns. Music of course changes at a much slower rate than technology but it has always responded to it in interesting ways. I want to look at things from this perspective and attempt to evaluate the ways in which I, as a composer, was motivated to invent the music I did. It's very important to me that the music comes first and that it overshadows its machinery. I've never been comfortable with glib demonstrations of the power of a new technology, particularly the kind in which the exhibitor runs through the equivalent of a few arpeggios. If we're going to take new technology seriously it's always worth remembering Bach's response to the development of tempered tuning. So, my talk will be partly autobiographical and I'll try to use music as a reflection of perspective. A lot of this will be personal and anecdotal. I probably have no profound and deep wisdom to offer and all I can tell you is how things appeared to me and what I tried to do.

Let me flash back now to the fall of 1966 when I entered the graduate program at Princeton [University]. These were very heady times in the musical world (pun intended). The paroxysms of postwar music had come to a boil and the world was full of institutions staking claims to hegemonic superiority, with Princeton perhaps leading the pack in America. Stravinsky

had become a card-carrying 12-tone composer and my first week at Princeton coincided with a visit by him for the premiere of his Requiem *Canticles* (1966) at McCarter Theater. The work was commissioned by Stanley Seeger, a Princeton alumnus, in memory of his mother. We all felt a kind of glee and sense of superiority: the future was ours and the rest of the world would come to its senses eventually and jump aboard. Even Aaron Copland was 12-tone music. well-known writing (A performer of new music was reportedly raising his children listening to nothing but 12-tone music.) It is hard to exaggerate the influence and brilliance of Milton Babbitt at that point. He was just 50, had hit his stride, and gave wonderful seminars on the theoretical and mathematical aspects of the 12-tone system, and was writing scintillating pieces. Required reading was Nelson Goodman, Rudolf Carnap, Ouine and others. The famous Princeton Seminars in Advanced Musical Studies had taken place in 1959 and 1960 (that led to the Musical Ouarterly issue and book appropriately entitled, Problems of Modern Music), and Perspectives of New Music had just been launched in 1964 at Princeton University Press, supported by Paul Fromm. Issue number 1 contained a landmark article by Babbitt, entitled "Twelve-tone Rhythmic Structure and Electronic the Medium." The article basically describes a way of organizing rhythm that is parallel to the 12tone system's way of organizing pitch, and is really only possible to do accurately on a machine. The opening paragraph of this article beautifully captures both the spirit of the times as well Babbitt's brilliance at articulating it.

"To proceed from an assertion of what music has been to an assertion of what music, therefore, must be, is to commit a familiar fallacy; to proceed from an assertion of the properties of the electronic medium to an assertion of what music produced by this medium therefore must be, is not only to commit the same fallacy (and thus do fallacies make strange bedfellows), but to misconstrue that compositional revolution of which the electronic medium has been the enabling instrument. For this revolution has effected, summarily and almost completely, a transfer of the limits of musical composition from the limits of the nonelectronic medium and the human performer, not to the limits of this most extensive and flexible of media but to those more restrictive, more intricate, far less well understood limits; the perceptual and conceptual capacities of the human auditor." (Perspectives of New Music, 1/1, p.49.)

(In characteristic Babbitt style, this paragraph consists of only two sentences.) Babbitt's point was simple and elegant, our ability to hear and perceive complex structures is not necessarily correlated with our ability to perform them, and the electronic medium is a vehicle to explore this dichotomy. He had a very persuasive set of demonstration tapes created on the RCA Synthesizer that he brought into seminar to prove this. Little did I realize it at the time but in a few years this dialectic would be one of the first that would break for me as I came to question these concepts of complexity and the relevance of the modes of perception he was concerned with. It is not my intention, however, to demean or belittle the spirit of these times and its avatars. These were exciting days. We felt that we were on the forefront of a real revolution. Perhaps I'm just remembering the excitement of being twenty-two and coming into a new high-powered environment, but as I look back I'm certain that something unusual was going on. Princeton was a "happening" place. We had a series of British visitors, Harrison Birtwistle, Bernard Rands, Jonathan Harvey and others who came to Princeton to feel the flame. (Jonathan was one of the first people to create a convincing computer piece with the clunky machinery I'll shortly describe. I was impressed.) In retrospect I think that whatever one's feelings are about post-war serialism, the results of this moment are still felt today in a variety of ways, principally in our willingness to accept the idea that music reserves the right to challenge the boundaries of our appreciation, and perception.

The RCA synthesizer had recently become the centerpiece of the Columbia-Princeton Electronic Music Center, founded in 1959 through a grant from the Rockefeller Foundation, and when the decision was made to house it on 125th street at Columbia rather than at Princeton, this set off a chain of consequential events, principally that Princeton composers eager to work with electronic music turned to the computer. They had, in fact, little choice.

This was the context in which I enrolled in a graduate seminar in computer synthesis taught by a young genius named Godfrey Winham. All that we had at Princeton to staff our branch office of the Columbia-Princeton Center were two Ampex tape machines and a pair of Buchla 100 series synthesizers, thanks to the generosity of Max Mathews and Vladimir Ussachevsky, respectively. The Buchlas, however, were not consonant with Babbitt's vision of the precision of the electronic medium. Though I may be misinformed, it seemed at the time that all one could do with these new Buchla boxes was patch voltage-control generators together to get dizzying electronic swirls. As far as I remember it would have been hard to synthesize the set of the Schoenberg 4th quartet in quarter notes, the anthem of Babbitt's 12-tone seminar. Of course Morton Subotnick proved a year later that the Buchla was capable of making exciting music, and Wendy Carlos, in 1968, on Moog hardware, showed that music with traditional syntax, if not a breeze, was at least possible. Princeton had recently upgraded to an IBM 7094 computer, which everyone was free to use, and Max Mathews had given us a digital-to-analog convertor, which unfortunately was no longer functional by the time I arrived. Godfrey's seminar was exciting. Charles Dodge came down from Columbia University for it and we had a varied assortment of characters there, including one who was interested in exploring the aesthetics of car crashes. Since the convertors were no longer working we had to drive to Bell Labs to convert our tapes, again thanks to the hospitality of Max Matthews. (Those who have driven on 2-lane roads through central New Jersey will realize that this was not a relaxing trip. As a junior member of the club it was often my job to take people's digital tapes to Bell Labs for conversion, and eight or nine 800 BPI digital tapes was an armful.) We were using an assembler macro language called BEFAP to run a version of Music 4B that Max had helped install. Tuck [Hubert] Howe, as an us undergraduate, had done some of the heavy lifting to get this all going. I was very excited by the possibilities. Now I could really explore Babbitt's vision. After a few months of fumbling I began to work on a piece that used combinatorial tetrachords (4 note chords with no major thirds that can thus combine with transpositions of themselves to form aggregates - combinatoriality was at the heart of the new revolution.) I then designed a system of formants tuned in major thirds so that there would be a functional relation between the particular transposition of a tetrachord and its timbre. I also had some sort of rhythmic scheme going but I forget the details. I would play my efforts for Milton, with whom I was studying at the time, and with his excellent ears he would pick apart pitches and issues in the upper registers, though I could never get him to risk broader criticisms. I worked on this for over a year until one day while listening to it I forced myself to admit that it just sounded terrible, and tossed it. While this was a daunting move for a twenty-three year old would-be composer it was also very liberating. My tread felt much lighter all of a sudden. (I would love to be able to play this for you but I scoured my closet and think it's long gone - trust me, it was ugly.) But I kept hope alive by listening to J.K. Randall's Lvric Variations for violin and computer, written for Paul Zukofsky, which I still consider one of the best early pieces of computer music, and was also made shipping tapes to Bell Labs. Here is an effective moment when the violin re-enters after a computer passage of about five minutes.

Example 1¹

This piece seemed to me to epitomize what was newly possible and had a kind of seriousness and tone that was inspiring. The second five minutes of the piece took nine hours to compute on the IBM 7094, and that was at a sampling rate of 20 kHz (and, it was not a batchprocessing machine). (It's interesting to note that Jim Randall has just turned 80 and is obsessed with creating pieces with Sibelius notation software and a MIDI synthesizer. I refer you to his CDs on Open Space.) It is worth noting at this point that the scene I am describing is somewhat different than what was going on elsewhere at the time. We were not engaged in spectral explorations, as they were at Stanford [University], for example, much to their credit and eventual profit, or in algorithmic composition as at the University of Illinois. In fact, one of Milton Babbitt's wellknown aphorisms was "No sound grows old faster than a new sound." Nor were we trying to break cultural or avant-garde boundaries. We were really interested in the domain described by Babbitt's vision. And the computer seemed then to be the ideal tool for this effort.

My first encounter with digital synthesis thus had the effect of beating my head against a brick wall. It was unsatisfying from every point of view. I decided to retreat to more traditional domains, which also proved frustrating and difficult. A forty-five minute string quartet got me pats on the back, but I knew it wasn't very good. I then got involved in collaboration with my former teacher George Perle (who recently passed away at the age of 93) on what was to become his system of "12-tone tonality." This occupied me from 1969 until 1973, and I wrote a number of instrumental pieces using it, only one of which survives, entitled Modal Fantasy (1970), for solo piano. In 1973 after the arrival of our own DA convertors and Barry Vercoe's Music 360 language, written to run on our new multi-million dollar, gold-plated, IBM 360/91 (with a whole megabyte of memory!) I decided to give the computer another whirl and again dived into pitch-manipulation creating an 18minute piece based on a 3-dimensional pitchclass array using the methods Perle and I had devised. The array was formed by a 0258 tetrachord and its inversion, in other words the "Tristan Chord" and the "dominant seventh. This was also partly inspired by Ben Boretz's massive dissertation MetaVariations, which was thundering around the halls of Princeton and had an extended section on the syntax of Tristan. With typical juvenile hubris I called it my piece mild und leise (1973). Here is the first minute:

¹ http://paullansky.org/icmc/randalllyricvar.mp3

Example 2^2

Now I really felt as if I had accomplished something. It took a year to complete and I sweated bullets over every note. It won an ISCM³ recording competition in 1975 and was issued on a Columbia/Odyssey LP (Electronic Music Winners, Columbia/Odyssey, Y34149). Twenty five years later Jonny Greenwood, of Radiohead, would come across it in a used record store and the four chord sequence that ends the passage you just heard would make its way into their song Idioteque on their 2000 Album Kid A. As a result it has unfortunately become my most famous piece. (Until I corrected it, the Wikipedia entry for mild und leise, only referred to my piece rather than to one of the most famous arias in the history of opera.)

One of the first things I noticed about this experience was not so much the joy of having a loyal and faithful performer in the computer, but rather that it improved my musical social life as I was able to play excerpts from the work in progress for friends, students and colleagues. I no longer had to wait for a concert and the composer's dreaded "perp-walk" as people dive for the exits to avoid having to say something to you. While I was proud and pleased with the piece I did notice two things that I eventually came to consider problems. First the timbral space was too limited. I was using frequency modulation, as it had just been developed at Stanford, (John Chowning's famous AES article had just been published, Journal of the Audio Engineering Society 21(7): 526-34) and a special arbitrary frequency response filter-design program written by Ken Steiglitz. I found the world behind the loudspeakers to be increasingly artificial and confined. Second, I noticed that there was decay in the listening experience. What seemed lively and exciting on first hearing became less so on repeated listenings. This, of course, is an endemic problem with tape music and recordings in general, and was not accounted for in Babbitt's vision. (Although I

did notice that recordings of live music decayed a lot more slowly than electronic music. Was there something about the music that was responsible for this?)

And there were a whole bunch of compositional issues. Far from reinforcing Babbitt's conception my frustrations seemed to contradict it. I became disillusioned with an approach to composition, furthermore, where one constructed the theoretical basis for a piece before composing it. Second, the world encapsulated by the loudspeakers began to feel 2-dimensional. Years later I would come to feel that there are two basic ways to look at the role of loudspeakers: as instruments themselves or as windows into a virtual space. This piece was lively in neither domain. I also felt that there was a problem in my approach in that it placed a much larger premium on pitch than on timbre. What was coming out had lots of sophistication in terms of harmony and counterpoint but the timbral landscape seemed like a placeholder. I began to wonder if, in fact, "the search for new sounds" wasn't such a bad idea after all. This led to my first piece using Linear Predictive Coding (LPC), Artifice, in 1976. I had enjoyed Charles Dodge's Speech Songs (1972) and decided to give it a whirl. Godfrey Winham and Ken Steiglitz had been experimenting with it and had written Fortran subroutines to do the math.

Example 3⁴

The piece attacked both of the issues I felt were problems in *mild und leise*. First it was highly motivic rather than being based on a precompositional scheme, and it was all about an exploration of vocal timbre. I think that ultimately it fails because both domains are too limited and it dwells too heavily on extensive manipulations of a small amount of data. But, for me it was a game changing experience.

LPC seemed like such a good idea at the time. Despite its obvious shortcomings it was exciting to imagine being free of the binding of pitch, rhythm and timbre. So, in 1978 I decided to give

² http://paullansky.org/icmc/

mild_und_leise.segment.mp3

³ International Society of Contemporary Music

⁴ http://paullansky.org/icmc/

artifice.segment.mp3

it another try with my *Six Fantasies on a Poem by Thomas Campion*. What is interesting here is that my motivation for doing the piece had very little to do with the lure of the machine, although it was certainly the capabilities of the computer and LPC in particular that enabled me to think in these terms. It all began, rather, with a seminar at Princeton on poetry and music led by the poet Lawrence Wieder. He introduced us to the Campion poem, *Rose cheekt Lawra*, as, per Campion's stated intention, an effort to create qualitative verse in English as in Latin, where stress is created by vowels rather than consonants.

> Rose-cheekt Lawra, come, Sing thou smoothly with thy beawties Silent musick, either other Sweetely gracing.

Lovely formes do flowe From concent devinely framed; Heav'n is musick, and thy beawties Birth is heavenly.

These dull notes we sing Discords neede for helps to grace them; Only beawty purely loving Knowes no discord;

But still mooves delight, Like cleare springs renu'd by flowing, Ever perfect, ever in themselves eternall

Observations in the Art of English Poesie, 1602

It struck me right away that to sing this poem would most likely flatten out its roll around the vowel box and that what I was really interested in was exploring the spoken text. LPC seemed to provide an ideal way of finding its inner music by orchestrating a spoken rendition of the poem. The poem, what's more, talks about implicit music and this was a nice conceit as well. Here are two settings of the opening quatrain from movements 1 and 4:

Example 4⁵

Example 5⁶

What I thought then, and still think now, is that part of the success of the piece lies in the way that it rises above the illusion of machine magic and manages to use the computer to make a larger point about the intricacies of human speech. This piece also opened my eyes to the real genius of the computer: its generalized ability to implement mathematics in software. It dawned on me at that moment that there was no music-making wizard lurking behind a curtain, everything resided in software and know-how. Tweaking LPC was a laborious task, and most of it was done by hand. My objective was simply to make it as realistic as possible, while taking advantage of the freedom from the binding of tempo, timbre, and pitch. (It's with more than a little peevishness that I take in the current uses of Auto-Tune, which I'm told uses LPC, via Cher or Lil Wayne. They seem to revel in just the faults of LPC that I tried so hard to avoid. I also notice the crummy nature of cell-phone transmissions, some of which apparently use LPC.) I developed a reputation for being good at LPC but in fact all I was doing is orchestrating around its weaknesses. One doesn't generally score music on an oboe that was written for a harpsichord, for example. Another interesting insight gleaned in the first ten or so years of the piece's life came from people's response when I told them that the piece was made at a 14 kHz sampling rate. They consistently said something like, "that's surprising, it sounds so good." It was as if there was an explicit connection between audio and musical quality. (On the other hand I can never understand how people could listen to those old scratchy mono 78's.) Finally, it quickly dawned on me that this was specifically not related to Babbitt's vision. It was not so much opposite as it was orthogonally related – it was just different. Rather than using super-human machine capabilities I was interested in teasing out those qualities in my wife Hannah Mackay's voice that made her

⁵ http://paullansky.org/icmc/campion-fan1.mp3

⁶ http://paullansky.org/icmc/campion-fan4.mp3

reading particularly sensitive, and human. The metaphor that I came up with at that point and used for many years was that the computer now seemed to me to be more like a microscope than a synthesizer. And, an idea that threads through almost all my work from this moment on seems to be the creation of a virtual space within the loudspeakers; a concern that my sounds create the illusion of having a physical source, one that involves motion and energy. This is where I think I draw a difference with *musique concrète* and a lot of terrific work that people have done involving spectral manipulation. I want to create the illusion that someone is back there banging, blowing, or beating something recognizable.

Despite my earlier promise I'd like now to spend a few moments reflecting on the struggles we had to get anything done in the years prior to the arrival of the NeXT machine. This is not so much meant to demonstrate how great things are now but rather to draw a picture of our relations with the computer during those years. In 1978 the ICMC was just a few years old and personal computers hadn't even been imagined. Nobody dreamed of ever interacting with a machine in real-time and most who were interested had to struggle to even get access to a computer. I gave a lot of talks and demos in those days and it didn't feel good. I was from a wealthy institution and had lots of access and freedom. Jealousy was the most frequent subtext I sensed behind admiration. It was a paradoxical situation. I was trying to create interesting music but all most could hear was the fact that it was made on a computer, and a big and expensive one at that. Moreover, until the early 1990's I would estimate, a significant part of ICMC talk consisted of bragging. "We've got a VAX", wow. I remember photos of people proudly standing by their newly acquired hardware: "We've got over 600 megabytes of disc storage." And, those here under forty probably don't remember the agony of getting a DA convertor to work. One of the longest nights of my life was spent with an engineer and an oscilloscope hooked to a DA circuit board, timing things and trying to see how many PDP11 mov instructions I could squeeze into a single sample period. It was not long after that that I read Tracy Kidder's book, The Soul of a New Machine, and my heart went out to the engineer who vanished leaving only a note saying that he had gone to where he would contemplate no length of time shorter than a season. I won't even go into the deflationary cost of disk storage except to remember that we spent about \$30,000 in 1986 for a pair of Fujitsu Eagles totaling about 700 megabytes of storage (and requiring air conditioning). (We're now at about 10 cents a gigabyte. You do the math.)

Another thing the younger generation won't remember is the extent to which we were still living in an analog world. My *Campion Fantasies*, done at a 14 kHz sampling rate, were captured on a Scully tape machine that added a noticeable hiss. Then when it was issued on an LP my beloved, noisy 5th movement sounded like garbage. My father, who was a recording engineer, told me that I was getting "inner diameter distortion" as the angle of the stylus to the grooves grew closer to the perpendicular. It was a landmark moment for me when I first saw someone play a CD on a Mac laptop. The convergence of audio and computing had finally arrived. This changed everything.

The point of this digression is to draw a picture of the relations we all had to musical computing prior to the advent of the NeXT machine in 1989, and in retrospect the extent to which NeXT changed the game. It was a daunting task to get access to the machines, let alone make them go beep. But we felt that we were part of a revolution and that it was all worth it. On the other hand the distractions were so numerous, both from the perspective of power and access, as well as jealousy and resentment that I often found the music getting lost in the mix. On top of that labor costs were very high. In 1982 I spent six months writing an I/O driver for the convertors I just mentioned and we ended up using them for about a year. Nevertheless we all saw the computer as opening up new musical vistas that we hadn't imagined before, and it did.

The next significant chapter in the evolution of my relation to the machine came in 1985 when I wrote *Idle Chatter*, now using the University's IBM 3081 mainframe.

Example 6⁷

I was still struggling with the classical problem of "tape music", the fact that it's the same every time, and that the music grows less interesting with repeated listening. Idle Chatter uses a kind of stochastic distribution, random selection without replacement, of LPCsynthesized voice fragments in which words are edited so that they are unintelligible and the pitch contours are slightly flattened so that in the aggregate they have recognizable pitches. The first thing I noticed about it was that everyone had a different reaction to it. Some tried to parse the words, some the rhythm, some the texture. The only thing nobody had any trouble with was the harmony, which begins the piece in a pretty simple F major tonality. I had originally intended to use more complex harmonies but found the listening experience much too exhausting. This, in fact, marked the beginning of my increasing interest in tonality. What is ironic is that tonality was initially not anything more than a way to have a placeholder so that complexity could reside in other domains. It's also ironic that it was the computer that gave me the freedom to do this. Had I written a string quartet in F major in 1984 at Princeton I would have been greeted with polite stares, at best. What was noticeable, however, was that my listeners had to do some work while they listened. The combination of this and the random textures seemed to be a step in the right direction with respect to the problem of decay.

I like to think of this as the moment I hit my stride. While I continued to search for other ways to work I now had acquired a vocabulary of creative options that made dealing with the computer more of a musical than a technological experience.

Several other threads that I followed were reimaging familiar sounds, as in *Night Traffic* (1990) and *Smalltalk* (1988), physical modeling (of which LPC is an instance), simple speech, without LPC, as in *Now and Then* (1991) and *Things She Carried* (1995-96), and modeling live performance, as in *Heavy Set* (1998) and *Folk Images* (180-81). Here again paradox arises in that all these approaches are emulating and transforming sounds of the natural world. In retrospect they seem to be an attempt to humanize the music and neutralize any machinelike tendencies, or in other words, hide the computer. I also seemed to be intent on rubbing against the grain, doing things that were not indigenous to the machine. Earlier, in the 1980's I did a set of folk-song settings using LPC on a violin sample. Here is the opening of a folk-like piece I called *Pine Ridge*.

Example 7⁸

(For this work Ken Steiglitz figured out how to shift the formants in LPC, allowing me to create a "cello" out of a violin, for example.) I was interested, almost vicariously, in the subtle things that good performers do naturally. For the violin sample I wrote a short piece for solo violin and recorded a performance of it by Cyrus Stevens. The experience taught me a lot about the violin, such as the fact that vibrato consists of a lot more than amplitude and frequency modulation, and that there is rich noise in the sound of the bow being dragged across the string. I also learned that the pulse-like excitation function of LPC, designed to model the vocal tract, was not so great for bowed strings. It would be twenty-five years before I would work up the courage to write for string orchestra, but it was clear even then that there was an aspect to my computer work that consisted of wishful thinking.

In *Night Traffic* I created a Strauss-like harmonic landscape for the sounds of cars passing:

Example 8⁹

I learned a lot from this. First that traffic noise is inherently ugly, second that by using a romantic harmonic landscape I could create an almost operatic scenario from an unlikely source (my colleague Ken Levy called the piece *Tod und Verklärung* on wheels) – my big

⁷ http://paullansky.org/icmc/idlechatter-seg.mp3

⁸ http://paullansky.org/icmc/pineridge.mp3

⁹ http://paullansky.org/icmc/nighttraffic-seg.mp3

breakthrough on the piece came while watching *Twin Peaks*, from which I blatantly stole the opening chord sequence – and finally I learned the evils of DC bias.

And in *Smalltalk* (1988), I raked plucked string filters over the quotidian sounds of casual conversation:

Example 10¹⁰

(The analog domain pokes its head in here as well in the form of high frequency pixie dust coming from the Sony Walkman cassette player I used to record the source.) There is an implicit tension in these pieces between Brahms and Cage. On one hand I'm interested in the music of everyday life, while on the other, very traditional musical values form the bed on which the images lie. The machine in these cases is probably more mediator than anything else. This is not to understate its power but rather to think of it more as a puppet master than virtuoso performer.

Physical modeling, on the other hand, exercised my interest in the complexities of real instruments. In this instance, from *Still Time* (1994), I luxuriated in the glories of superhuman flutes, thanks to Perry Cook's slide flute model.

Example 10¹¹

But once again I spent way too much time worrying about all the things that real instruments did that I couldn't manage.

One of the most recent works I did is an interactive piece for five laptops, written for the Princeton Laptop Orkestra (PLOrk) called *A Guy Walks Into a Modal Bar* (2006). The title refers to my port to SuperCollider of a number of Cook/Scavone STK physical models, the modal bar ones in particular. This excerpt is from a movement called *Mbira Madness*, (The mbira model is not from STK, it's someone's clever SC3 patch, although a number of the other sounds are from STK.)

Example 11¹²

This doesn't sound much like an Mbira of course, but this is probably due more to tuning than timbre. (If I had tried to emulate the tuning I probably would have been susceptible to a charge of cultural imperialism, which I take much more seriously than undue physical modeling.)

Finally, I have two examples of rather blatant physical wishful thinking. The first is from a piece that constructs an algorithmic model of an improvising pianist, with very big hands. This, again, is an attempt to get into the skin of human performers. It's called *Heavy Set*.

Example 12¹³

The piano is thanks to Kurzweil. The results would be different with different random seeds, of course, but I routinely used my family member's birthdays and couldn't break faith with that. I'm very proud of my flat-third algorithm and wish that I could write real piano music that flowed this smoothly.

And last, here is a segment of an ersatz orchestra piece, called *Chords* (1997).

Example 13¹⁴

This was made by granulating the SGI sample library. When I wrote it I was certain that this was the closest I'd get to writing a real orchestra piece. As we speak, I'm in the process of finishing one and began it, in fact, by doing a transcription of this piece and attempting to orchestrate it, a task at which I failed, giving me a little more confidence in the efficacy of this computer piece as well as new insight into the complexities of writing orchestra music.

So, what originally began for me in 1966 as an attempt to bypass the frailties of human performance and traditional instruments ended up as a way to glorify just these things. At the end of the day, moreover, I think it is the computer that created my intense interest in the qualities of everyday, unmediated sounds. Thus when I found myself writing music that didn't

¹⁰ http://paullansky.org/icmc/smalltalk-seg.mp3

¹² http://paullansky.org/icmc/mbira-seg.mp3

¹³ http://paullansky.org/icmc/heavyset-seg.mp3

¹⁴ http://paullansky.org/icmc/chords-seg.mp3

involve electricity it didn't so much seem to be abandoning the realms of physical modeling and machine performance as much as it felt as if I had my hands on those things that I was grasping for in my computer work. The challenges are of course entirely different. Now instead of worrying about distortion in the high register I worry about page turns. Instead of worrying about debugging software I worry about rehearsal schedules. But a lot feels familiar. I wrote a percussion quartet for Sō Percussion. When they asked me to do it I objected, saying that I had never written for percussion before and worried that I'd be alone on the island with only a loincloth. They objected, citing Table's Clear (1990) as a terrific percussion piece. What surprised and pleased me, however, was how familiar writing for human percussionists felt. I had to pay attention to spectral envelopes, registral transients and balances, masking and interference, spatial distribution and so on. The basic difference was that rather than trying to create an impression of physical activity I found myself actually choreographing it. And, now that I'm doing what I swore I would never do, write orchestral music, things feel familiar in the same way.

I view my work as a constant attempt to "get it right", as most of us do, to find and express the implicit music within me rather than within an instrument or machine. In almost all the pieces I've done I have the feeling of almost getting it right, but not quite. And the process over the years has been akin to getting better at almost getting it right. I found at the end of my time working with computer music that this process had ceased in a sense. I was good enough at it to get what I wanted and while I wouldn't claim that my later pieces were any better than my earlier ones, I did feel that just the sense of getting better at something was gone, and "getting it right" was no longer the main issue. Now, however, I find myself clinging by my fingernails to the bottom of a very steep cliff. It's frustrating to begin a climb with the realization that I don't have the seemingly unlimited years ahead of me that I did when I was 35, but nevertheless the process of climbing the wall is exhilarating.

If I do have any valedictory wisdom it's this: the real genius of the computer lies in its ability to intervene and operate on many different levels and in many different ways. I think that one of the problems with conferences like this is that there is an implicit pressure to demonstrate technological muscle. I'd run out of fingers and toes many times over were I able to recall all the conversations I've heard in these and similar halls that faulted an otherwise lovely piece for its simple-minded use of technology. While it is true that the function of these conferences is to advances in technology. exhibit music sometimes suffers in the process. I guess my advice then is in the form of a recommendation to feel free to use whatever computing resources seem musically appropriate, from the complex to the simple, and even, as in my case, to choose not to use them at all.

Tae Hong Park

Georgia State University park@gsu.edu Conducted by Tae Hong Park, 2011, via email

It seemed that composer Paul Lansky – who has been, and still is, an important figure in the field of computer music - was going down the road that many "electronic music composers" had gone before him. That is, continue to primarily write for computers rather than human performers and acoustic instruments. With over 40 years of dedication to the electro-acoustic music field, there seemed to be no particular reason to think that he would suddenly unplug the machine. That is precisely what happened around 2007. This interesting turn of events seemed like an apt opportunity to catch up with Lansky to revisit his "previous career" as an electronic music composer, learn more about his recent activities in instrumental music, and also talk about future plans.



Figure 1. Dorian Wind Quintet, Lansky at center of picture from 1965.

Early Days

Tae Hong Park: I remember that you attended an art/performance high school and also became a professional French horn player. Can you tell us a little bit about your family, education (primary school up to graduate school), and your "brief career" as a French horn player?

Paul Lansky: There was some music in my family. My father was an amateur bass and sang

with the Schola Cantorum [Schola Contorum 2011¹⁵] in New York City (they did the Verdi Requiem with Toscanini before the war). He later went on to become director of the NYC studios of Capitol Records. My first musical instrument was the guitar. I started around the 3rd grade and was studying classical guitar before long. In Junior High I joined the school band and chose the French horn. I seemed to have an aptitude for the instrument, one thing led to another and I auditioned for the High School of Music and Art Inow known as Fiorello H. LaGuardia High School of Music & Art and Performing Arts] and was accepted as a horn player. It was a glorious experience. My classmates included Joshua Rifkin, Richard Taruskin, Paul Dunkel, Martin Bresnick, and many others who went on to significant professional musical careers. Then I went to Queens College as a music major, primarily studying with George Perle and Hugo Weisgall. I was already becoming interested in composition but my early efforts were thin and pretentious (although I won the Joseph H. Bearns Prize in 1964). I was still unsure about which way to go – performance or composition. I studied horn with Joseph Singer, the first horn in the NY Philharmonic at the time and was playing a lot. During my last year at Queens I joined the Dorian Wind Quintet [Dorian Wind Quintet 2011¹⁶]. It was a great experience but I was becoming more interested in composition and left the quintet to come to Princeton University in 1966.

THP: Is it at Princeton that you met your wife Hannah Mackay? I remember that she had an acting career and was in a film with Al Pacino.

¹⁵ http://www.scholacantorum.org/

¹⁶ http://www.dorianwindquintet.org/

She also was in a number of your tape pieces, if I am not mistaken.

PL: I met Hannah at Queens College. Yes, she worked as an actress for many years, films, television and commercials mainly. She worked with Al Pacino, Rip Torn and others. She is the voice in a lot of my pieces starting with *Artifice* in 1976. All the way through *Alphabet Book* (2002) and starring in *Things She Carried* (1997). The fact that she was a trained actress had a lot to do with her work with me.

THP: What kind of compositions did you compose when you were a student at Queens? Were you exploring tape music or possibilities in "Elektronische Musik" during that time?

PL: Electronic music was really off my radar while I was an undergraduate student. Queens didn't even have a studio (this was the early 1960's). I did hear the première of Babbitt's Philomel (1964), at the Metropolitan Museum of Art in New York, and really liked it but aside from that Gesang der Jünglinge (1955-1956) and Poème électronique (1958) I didn't know much. The music I was writing was influenced more by Luigi Dallapiccola perhaps more than anyone else (with a little bit of Stravinsky and some early Schoenberg). I wrote a pretentious setting of a Shakespeare sonnet for two pianos and choir (for which I won the Bearns Prize¹⁷), some songs based on Sappho, some piano music and a few choral pieces. It was all very juvenile. I was still flirting with the idea of going into performance, and was also interested in musicology and theory. Queens had a famous theory program. I took several courses with Felix Salzer, who was a student of Schenker (who was a student of Bruckner). I can't say I was an early bloomer as a composer. Rather, I was involved in a range of musical studies and activities, including composition, which won out in the end. It was to be a while before I would write a piece that I was really proud of. Quite a while, in fact.

THP: After Queens, you went to Princeton

University for graduate studies in 1966. What motivated you to go from composing for acoustic instruments to composing using solely the computer?

PL: In my first semester at Princeton there was the first ever (I believe) course in computerbased sound synthesis (at least at Princeton). This was the fall of 1966. It was taught by a voung genius named Godfrey Winham. Charles Dodge came down for it, as did a number of other people. The director of graduate studies at that time, Ken Levy, twisted my arm to take the course. We were using an IBM 7094 and the converters Max Mathews had given us no longer worked so we had to drive to Bell Labs in Murray Hill to hear our results. I immediately found it interesting but tedious. I was very involved in the 12-tone system at the time and worked on a piece using combinatorial tetrachords. The timbres had formant regions that were tuned in major thirds (a combinatorial tetrachord has no major thirds in it) so there would be a reflection of combinatoriality in timbre. I worked on it for a year or so and finally bagged it. It sounded horrible. I wish I had saved a tape of it, though. We were using a macroassembler program called Bell Laboratories FORTRAN Assembly Program (BEFAP) to run Music 4B. This was an interesting juncture in the history of music technology. The folks at Stanford University were moving on to Music V. At Princeton, however, people were intent on staying with Music 4. A year or two later Tuck (Hubert) Howe translated it to Fortran IV (Music 4BF) when Princeton abandoned the IBM 7094 for the IBM 360/91.

I can't say that I felt I was abandoning acoustic instruments at that point. I wrote a string quartet and some other pieces during that time. It wasn't until 1973 or so that I began to see the two alternatives and an either/or proposition.

Godfrey Winham was an amazing character: composer, theorist, and technologist. Ken Steiglitz tells the story about the time they went to Hewlett Packard to try out their HP 2116 (the first computer HP made) to run our DACs, and Godfrey had a handwritten HP assembler program that used a tail-chasing circular buffer (high/low watermark) scheme to read the records from the digital tape. He typed it in on the spot and it worked first time out, to everyone's amazement. It was also probably the first HP assembler program he had ever written.

¹⁷ Editor's note: Joseph H. Bearns Prize in Music open to US citizens; past winners include Milton Babbitt, Alvin Curran, Mario Davidovsky, Charles Dodge, Anne LeBaron and many others

He died of Hodgkin's lymphoma in 1974.

Getting Hooked: Abandoning Acoustic Instruments

THP: Do you think that the very methodical and systematic compositional strategies that are characteristic of 12-tone music lead you to composing with computers? What specifically triggered you early on in deciding to devote the 40 years to computer music?



Figure 2. Paul Lansky from 1981 with various gadgets including a Heathkit amplifier, samplerate controller, low-pass filters, and a Scully tape-machine and HP "mini" computers in the back.

PL: The attitude at Princeton regarding electronic music was that the real beauty of the medium lay in the precise control over rhythm and pitch. Timbre was secondary. One of Milton Babbitt's *bon mots* was "Nothing grows old faster than a new sound." This was not completely the case, however. New timbres were explored but there was a real interest in tying them to functional aspects of the composition. Nevertheless, some of the early blockbusters such as Jim Randall's *Lyric Variations* (1968), or *Mudgett: monologues by a mass murderer* (1965), were glorious to listen to, and had really wonderful sonic surfaces. There

was a little competition between Milton's work with the RCA Synthesizer and our work with the computer. Milton claimed sonic superiority (probably rightfully so) since his was an analog signal and ours were created at a 10 kHz sampling rate (20 kHz through the half-speed gambit).

Barry Vercoe came to Princeton in the early 1970's as a visiting fellow and wrote Music 360 to run on the new IBM 360/91. I started to play with it in November 1972 and explored the timbre/pitch world of the work I had been doing with George Perle (that led to his 12-tone tonality). I built a 3-dimensional array based on the Tristan Chord and made timbral alterations in parallel with it. We had just started to fool around with FM synthesis developed at Stanford University and I used the array to control such things as the index of modulation etc. This led to *mild und leise* (1973) (this is my famous *Radiohead* piece, more on this later.)

I was hooked, but I think the primary reason was that contrary to my expectations what I really got out of the machine was a much more interesting musical social life. A bunch of us were working late at night at the computer center and would trudge over to the converter room in the EQuad [Princeton University engineering building] together to listen to our work. I got wonderful feedback on my piece as I was working on it and when it was finished, it was really finished. At that point I had little patience for writing a score and waiting around years for a B+ performance of what probably was a B- piece. Now I could create music that sounded right to me and that I was proud of. That's probably what kept me at it for the better part of 40 years. This might have had something to do with my background as a performer but I think basically that I'm just an arts and crafts shop kind of guy.

Machine as a Window on Familiar Reality: Speech and Text

THP: In a way it seems that *mild und leise* (1973) was a musical break-through for you, leading you on a compositional journey where the computer played a critical role. Unlike *mild und leise*, however, a great number of your computer music compositions dealt with the voice. Can you elaborate on how you got interested in using the voice in your compositions?

PL: After mild und leise I felt dissatisfied with solely using synthetically generated sounds. It could have been the cumbersome machinery but I had the feeling that synthetic sounds aged too quickly. I also think this was the beginning of my view that there are two kinds of electronic music: one in which loudspeakers are the actual instruments (think Xenakis) and another where they are more like windows into a virtual space. I was very excited by Charles Dodge's work with linear predictive coding (LPC), and this seemed like an ideal way to explore the latter approach, using the machine as a window on familiar reality, in this case speech. I then worked on Artifice (on Ferdinand's Reflection ..., (1975-76) which used my voice and Hannah's voice saying a line from Shakespeare's The *Tempest*, "This music crept by me upon the waters." This turned out to be a big sprawling piece, which I've never released but was a breakthrough for me. I felt that the machine was giving me an entryway into a much larger domain. This was also the beginning of my work in software. I used Music 4BF but wrote a 16-track mixing program standalone in FORTRAN to create a kind of multi-track recording studio environment. We were on a 'funny-money' computing budget and I found that it was cheaper to resynthesize and mix only what you wanted to change than to redo the whole passage or piece. This is where I came up with the idea of adding to the disk at random points rather than simply writing out everything again. This is the origin of the MIX program.

The next step was my Six Fantasies on a Poem by Thomas Campion (1977-78). I regard this as my first mature piece in many ways. Everything seemed to fall together: software, musical conception, synthesis techniques, text, voice, etc. In many ways I consider this piece to be more about orchestrating Hannah's reading of the poem than it is about the Campion text. It was also the first of a number of pieces using Hannah's voice. It made me realize that she was a really valuable collaborator thanks to her training in acting. Most of all, this piece made me realize the incredible potential of the machine. I'm delighted that the work has taken on a life of its own. It still gets radio play, is discussed in a number of books, and several dissertations have been written about it. A fellow in Norway, Andreas Bergsland, wrote software to simulate aspects of the piece in a recent dissertation¹⁸ on the voice is electronic music.

THP: Did the FORTRAN program evolve into MIX, CMIX, and finally into RT-CMIX programs?

PL: Yes, the MIX program evolved to include synthesis. Since in my MIX program, I was writing samples to a disk I decided to see how difficult it would be to also generate samples in the program rather than simply transfer them. It turned out to be really easy and gave me a complete software environment. In the mid 1980s when we stopped using the University mainframe and migrated to a MicroVax II, I translated the MIX program into C and called it CMIX. It's a really simple idea. It's just an architecture for writing samples to a disk in a variety of ways: destructive writes, additive writes at arbitrary disk locations, etc. CMIX has no scheduler. It simply writes or adds wherever on the disk you tell it to. I thought computers would never be fast enough to do all this in realtime, or at least not for a while. It would take the vision of Brad Garton and others to make it into a real-time program much later, RT-CMIX. One aspect of CMIX that really turned out to be quite wonderful was a front end language, MINC, written by an undergraduate in my computer music course, Lars Graf. MINC is basically a Clike programming language to generate data to be used by CMIX. I used this a lot in my subsequent pieces. (When I discovered SuperCollider my first thought was that this was what CMIX would have been like if I really knew anything about programming.)

THP: It seems also quite interesting that in Charles Dodge's *Speech Songs* (1974) for example, the composer really exposes the artifacts of the LPC algorithm bringing the machine to the forefront in a humorous sort of way. In your use of LPC, however, it seems that the machine is more in the background and at times very much transparent. Can you comment on this?

¹⁸ http://folk.ntnu.no/andbe/Projects.html

PL: My goal with LPC was to make it as indistinguishable as possible from the real thing. This required a lot of hand massaging. I wrote software to patch the pitch analysis frame by frame. I added white noise to simulate the hiss in the voice, and I did a variety of things to mask the inadequacy of the process, such as pitchsynchronous frame updating, rather than simply using the standard frame rate. Still, at the end of the day it didn't sound all that great, and when people complimented me on my synthesis I would say that I was simply doing what any good orchestrator does: write music that's appropriate to the abilities of the technique. One wouldn't write music for an oboe that's meant for a harpsichord (although Bach did.) One of my contributions to the technique was formant shifting, but while I came up with the idea, Ken Steiglitz did the math. Oddly enough I found when we moved to higher sampling rates that LPC became much harder to handle. There is something about the distribution of formants/poles that works better at low sampling rates. Oh yes, one other thing. The standard LPC analysis technique is autocorrelation. We didn't use this, however. We used something called covariance. This supposedly gave better results, although I don't understand why (ask Ken). It was also a lot more costly and unstable.

Worst of Both Worlds

THP: The majority of your computer music compositions seem to be written for tape. One of the few pieces that I remember seems to be *As If* (1981-82) for string trio and tape composed in the early 1980s. Was this a conscious decision not to compose much for tape plus instruments or was it just a matter of inopportunity?

PL: I actually did a number of pieces like that: *Stroll* (1988), for tape, piano, marimba, flute and 'cello, *Values of Time* (1987) for tape, flute, oboe, clarinet, bassoon and string quartet; *Six Years Ago, Monday* (1996), for marimba, violin and tape; *Talkshow* (1989) for interactive voice modification, and *A Guy Walks Into a Modal Bar* (2006), for five interactive laptops. There are, however, several things that constrained me: first, I think that the combination of natural sound and loudspeaker sound is sometimes like oil and water in that they just don't mix well. They radiate in different ways. *Stroll* and *As If*, were recorded and I think they are more successful that way (on tape) rather than in live

performance settings. Second, composing the pieces often felt like the worst of both worlds for me. I didn't have the freedom of pure electronics, nor the freedom to let instruments do their thing in unfettered ways. I loved working with players but as soon as the tape came on they lost their natural flow. Third, interactive systems that processed natural instrument sounds never appealed to me. Having tried for many years to model natural sounds I just loved the sounds of pure unprocessed instruments. The fine grit in the sound of a bow on a violin string amazes me. Finally, I just don't feel that I did my best work that way. As If is probably the best of the instrument and tape pieces. It's been play a lot, including at the Philhamonic's Horizons festival in 1984. Interactive systems are interesting but to me they often don't get beyond demo mode look at the cool things you can do with a computer. I felt that way about my piece Talkshow, where I quantized and processed people speaking into a microphone. Some people can do these things very well, but I just felt that it was not my natural medium, whereas sculpting sound on tape seemed was something I loved and was good at. (I just went back to listen to my piece for marimba, violin and tape, Six Years Ago Monday, where the tape part created more ambient types of sound and I think this works pretty well.)

Now and Then

THP: Speaking of "cool things" what are your thoughts on "laptop orchestras" and "smart phone orchestras?"

PL: I don't have much to say about that. It's still immature and living in demo mode, but there is lots of potential.

THP: I remember reading an article featured in Keyboard Magazine in 1994 entitled "The Next Big Thing" in which the author was raving about physical modeling and how it would be a powerful force to be reckoned with post FM and wavetable synthesis. At that time I was working for LG Electronics and we were also investigating and researching its potential but decided to drop it. It seems to me that physical modeling did not quite explode as some had predicted. I know you have been involved with physical modeling in your work, including applying the extended plucked-string model developed by then Princeton student Charlie Sullivan. Can you elaborate a little about your work in this area and give us your thoughts on the somewhat "subdued" proliferation of physical modeling synthesis?

PL: I got interested in physical modeling first through LPC and then by a conviction that, for my music at least, I wanted sounds to project the illusion that there was some physical action behind them. Ultimately it wasn't so much the veracity or accuracy of the sound as it was the mechanics of its creation. This is what attracted me to Perry Cook's modal bar synthesis. Generally these models are created by techniques that model what happens when you hit something that can resonate. Even when they were unrealistic you still get the impression that some physical activity is involved. And what's more is that you can extend the models in different ways that are not possible in the real world. When I used Perry Cook's slide flute model I enjoyed creating models where the flute was 10 feet long. At the end of the day, however, what I really cared about was the mechanics of the sound's creation. Charlie Sullivan's distortion guitar model was really fun to work with (thank god for Princeton undergraduate students). You could really create the impression that there was some sort of freak monster electric guitar behind the curtain.

I don't really have too much to say about the "success" or "failure" of physical modeling in the commercial world. It's become easier to fool people, however, and a Hollywood film composer equipped with Sibelius, ProTools and a professional sound library can go a long way towards putting live musicians out of work. I've been fooled. Eric Lindemann at Synful.com has done some very impressive work. I don't know how his software works but he claims to be doing physical modeling.

Another aspect of physical modeling that I liked a lot was the extent to which it incorporated noise (randomness) in the signal. I can't speak for others, but to my ears this goes a long way towards creating an anti-aging aspect in the sound. I always found that simpler synthesis methods create sounds that grow old very quickly. I'm not staying current with developments these days but I wonder whether the increased storage and CPU capacities have made sampling a more viable alternative to physical modeling. A lot of pop groups routinely use sampling rather than go to the trouble of synthesizing something.

And speaking of pop groups: it's not without a little dismay that I notice how crummy artifacts are becoming accepted, even desirable sonic results, like Auto-Tune.

Popular Culture

THP: Speaking of pop groups ... I know a lot of people know this story, but for those who do not, could you say something about your *Radiohead* experience?

PL: Sure. In 1975 I entered mild und leise in a competition that resulted in its release on a Columbia/Odyssey LP with a number of other pieces. It was called *Electronic Music Winners*. It sold a lot of copies by classical standards, well over 7,000 by my last count, and thus still pops up in used record stores. I've seen it at the Princeton Record exchange [a "well- known" record store in Princeton, NJ]. In 1999 or so, when Radiohead was doing the OK Computer tour in the U.S., their guitarist, Jonny Greenwood bought a copy in such a record store. At that time (and to this day) the Radiohead guys are striving to find ways to get out of their own skin, e.g. not just recycle the same pieces. Of course, this is what every good composer does. In this spirit, Jonny then did an improvisation tape, combining a funky drum track made on his analog synthesizer with a bunch of sounds, records, a microphone hanging out of a window, etc. He then gave the recording to Thom Yorke [Radiohead's lead singer] to make something out of it. According to Yorke. "Idioteque wasn't my idea at all; it was Jonny's. Jonny handed me this DAT that he'd... he'd gone into our studio for the afternoon ... and, um, the DAT was like 50 minutes long, and I sat there and listened to this 50 minutes. And some of it was just "what?", but then there was this section of about 40 seconds long in the middle of it that was absolute genius, and I just cut that up and that was it..."¹⁹ That 40 seconds consisted of some of Art Krieger's Short Piece (1976), and the opening of *mild und leise*²⁰. What Thom

¹⁹

http://www.npr.org/templates/story/story.php?s toryId=15226006

²⁰ Editor's note: both pieces were on the *Electronic Music Winners* album from 1976.

excised from my piece was a four-chord sequence consisting of four different spacings of an E Major 7th chord (E, G#, B, D#, there is also an F# which is a 3^{rd} harmonic of the B, that pops through – I was playing around with combinations of major and minor thirds as in the "Tristan chord"). This was the basis of their song Idioteque. It's interesting to me that these four chords are the only harmonic material in the entire piece. It rocks back and forth between G minor and Eb Major (they lowered it a half step by slowing it down slightly). Anyway, when Thom played the song for Jonny they realized that someone else had written some of the music and that they'd better get permission. I then got a long, apologetic and quite charming email from Jonny explaining the situation and asking if they could have my permission to use it. He sent me about 15 minutes of the improvisation tape as well as some of their albums. They were very generous about compensating me and I struck up a friendship with Jonny Greenwood. We're still in touch and he gets me tickets whenever they play in the N.Y. area.

I think *Idioteque* may be the only *Radiohead* piece to originate entirely in the studio rather than in performance. When they were about to go on their *Kid A* tour in 2000 Jonny told me that he didn't see how they could perform the piece. Fortunately, I still had the digital master and sent him the clip. As a result, they performed it at virtually every concert they did until 2010 or so.

There are several interesting aspects to this. First. mild und leise, was really an "experimental" piece. I was interested in playing with pitch-class arrays and frequency modulation. When I was working on the piece, Milton Babbitt had just come back from a visit to Stanford University and was raving about a new synthesis technique, frequency modulation. I'm thus tickled that it shows up in a pop experimental piece. Second, I was about 28 years old when I worked on it and Jonny was about 28 when he came upon it, and there was a 28-year time lapse between the two. He told me that this occurred to them, too. Finally, it is now my most famous piece. I had hoped that it would die a quiet death. Eighteen minutes of grinding FM and formant synthesis is a bit difficult to take. But, I've had a blast swimming a bit in the wider world with it. I still get email from people around the world asking about it, mainly young people, and have had some interesting

conversations. Finally, and this is the funniest part, I discovered that the Wikipedia article on *mild und leise* just referred to my piece. I went in and rewrote it to say that it was the opening line in one of the most famous arias in all of opera. Fortunately this entry has now been redirected to *Liebestod* (1857-1859) where it mentions my piece parenthetically as an adaptation. Even this is a great honor.

THP: Quite an interesting story indeed. Continuing on the pop culture thread: one of the most fascinating guitarists that I remember seeing was Stanley Jordan; this was on a Jonny Carson show in 1985. I distinctly remember his two-handed tapping technique, which was quite unusual at that time – at least for me. Only later did I find out, however, that Jordan studied with you and Milton Babbitt. I do not think the name Stanley Jordan particularly resonates with computer music but I understand that he had some interesting ideas? Can you talk a little bit about his interactions with you at Princeton?



Figure 3. Lansky with George Perle around 2003

PL: Working with Stanley was a joy and a whirlwind trip. He was constantly reinventing the world. It was about that time, in 1979 or so that Alan Forte's book, *The Structure of Atonal Music* was published. Stanley was concerned when he saw the index of the book containing all the possible chords because he thought that he had figured it out first. There were a bunch of other things like that. He got interested in using the computer (IBM 360/91) but thought it was much too tedious to enter notes one at a time so he taught himself the IBM programming

language APL²¹ and, if I remember correctly, he figured out how to map the computer keyboard so that he could pretend it was a guitar, and then he simply "played the keyboard to generate massive note-lists. He synthesized a piece called Havdn Seek which had thousands of notes. He subsequently contributed several times to the APL journal. He also built a small hardware synthesizer with a guitar-like interface, soldering chips and all. This was the late 1970's. It wasn't something everyone did. He then built a hologram. Benny Carter was teaching at Princeton at that time. Stanley asked to appear on a concert Benny was giving at Princeton with Dizzy Gillespie. I think he wanted to play with them but Benny gave him a solo slot. It brought the house down. I still remember Dizzy standing in back of him mouthing the words "How does he do that?" I can't say that I taught Stanley anything. With a student like that you just have to point him downstream and make sure he doesn't go over the falls.

A Rediscovery

THP: It seems that Jordan was much more involved with machines than what I had initially thought ... You yourself have been using machines to create much of your work throughout your career. That is, until 2007 or so ... In 2007 you set aside the computer keyboard, picked up a pen, and began writing notes on paper opposed to computer code. Did this happen overnight or was it a more gradual process?

PL: It was really a gradual process. There are several basic reasons. First: one thing I loved about doing computer music was that it had a great price/earnings ratio. That is, the return on the time you spent was reasonable. At the end of the day you had sound and it was the sound you wanted. I was very frustrated by the amount of time I spent writing parts and score for the few instrumental pieces I did in the 70's and 80's and especially frustrated by the fact that when I finally heard the piece I usually felt it needed revision but couldn't afford the time redoing parts and score. Computer autography programs have changed all that, of course. The second,

and more substantial reason is that I felt that I had said what I had to say in the electronic medium and wanted to do some new things before I got too old. I had never, for example, written orchestral music and when the opportunity came up in 2007 to write a piece for two pianos and orchestra. Shapeshifters (2006-07), I jumped at it. Boy was that a learning experience. I now have five orchestral pieces and they've all been performed and recorded. This brings up a third reason: I've always enjoyed *becoming* good at something more than being good at it. There is a much more exciting journey of discovery in learning the ropes than there is in being master of them. Finally, I realized that a lot of my computer music was involved in creating the illusion of real sounds using physical modeling, speech synthesis etc., and maybe it was time to get my fingers into the real thing. In this respect it has been interesting to apply the lessons I learned about handling spectra but in the realm of real instruments: envelope, spectral balance, masking, etc. I've now written a lot of percussion music, for example, and these lessons have been especially useful there. I don't think everyone writing electronic music should write for real instruments but I think the reverse is true. Writing electronic music is the best ear training.



Figure 4. More recent photo – circa 2005 at Princeton University

THP: I won't dwell too much on this topic as

²¹ Editor's note: named after the book *A Programming Language* by Kenneth Iverson.

we are also including your 2009 ICMC keynote address with this issue. However, you mentioned above that you "always enjoyed becoming good at something more than being good at it." You have obviously composed for non-electronic instrumentations prior becoming a "full-time" instrumental composer. But since you have been solely focusing on acoustic music for the past five years or so, do you consider yourself to be at a level where *you* think you are now "good" ... or do you think you are still enjoying "becoming good" with have a lot more to improve? Do you see yourself engaging in instrumental music for the foreseeable future?

PL: Good question. The more I think about this "being vs. becoming good" adage the flimsier it gets. It's very hard to evaluate where I am now on this spectrum with instrumental music, there is still so much that is relatively new to me. The shock of the first rehearsal, for example, is really something else. It very rarely seems to be the piece I imagined but it takes experience to factor out rudimentary performance problems and it's a complicated trip from there to the real piece. My inexperience probably shows in the extent to which I find myself revising after the first performance. But I'm uncertain I'll ever get to a place with this stuff where I can sit back and sav "I'm good." I had a big orchestra piece, Imaginary Islands (2010), played on the same concert with the Strauss Suite from (1909-1910). That Rosenkavalier was a humbling experience. And the other night I listened to the Rondo Burlesque from Mahler's 9th. On the plus side I think writing orchestral music has given me new insights into the absolute genius of this accomplishment, but on the negative side I thought "why do I even bother." So to answer your question, no I don't think I'm "good" but I'm getting better. I don't think I'll ever go back to electronic music. I really miss it, particularly the tactile feel of the process, but I'm enjoying where I am, for the moment...

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In 2001, Paul Lansky released his CD *Ride*. Lansky's accompanying liner notes are rather unusual. While most electronic music recordings tell the reader exactly how the composer made the sounds, Lansky gives the following technical notes:²²

I look forward to the day when nobody will care whether or not a computer was used in the process of making a piece. If any kind of music is to survive it has to hide its technology. (After all, virtually everything that is recorded today involves computer mediation to some degree.) To my mind, "Computer Music" should become irrelevant as a distinct category. While it's obvious that computers can do things with sound that have been previously unimagined and unimaginable, I remain convinced that what we hear as 'music' has everything to do with the voice of the utterance–what is being said–and little to do with the machinery it uses to speak. (Lansky 2001)

Prior to *Ride*, Lansky was not averse to telling his audience, as another set of his liner notes puts it, all the "gory" details behind his works. (Lansky 1998) Even in *Ride*, he follows the above statement with a comic retreat: "but since you asked, aside from the pre-recorded sounds, all the music on this CD was created entirely with software on a Silicon Graphics workstation and Apple iMac computer." Despite his reservations, Lansky leaves the "computer" in computer music. (Lansky 2001)

Lansky's concerns reflect larger trends in writings about electronic music. Too often, essays and books discuss electronic music process rather than product. They tell us how a composer arranged his binary to vibrate the coil in a speaker, rather than telling us what the air sounded like after that speaker vibrated. This approach shortchanges what electronic music can do. Electronic music allows for a closer, more privileged relationship between listener and composer that does performed music, and, because writing about electronic music so often focus on process rather than product, this relationship has yet to be fully assessed.

Meaning in performed music is based on a single version or a collection of performed versions of a written score. Even if a musicliterate listener only reads the score, that work is performed in that listener's mind. In contrast, electronic music requires no such effort. Lansky's *Ride* is dependent on but one aural instance: the digital master stamped onto each CD.

Criticism of performed music must contend with the distances between composer and listener and between the written work and aural instance. Some critics believe a written score best reflects a composer's intention, while others think a particular performance captures a work's meaning. Electronic music leapfrogs these concerns. There are no barriers between a listener and the composer, no multiple live versions to compare against a score, and no score to compare against the imagined composer's ideal of the work. When listening to *Ride*, the listener is *closer to the source*. The original instance is already present, naked to the ear, unchanged in its journey of reproduction.

While criticism has not discussed electronic music at length, the subject of performed music has been the subject of much inquiry. In his 1989 essay, "A Secondary City," George Steiner pines for a society in which any discussion about the arts, aside from "dispassionate [summary] is prohibited." (Lansky 2001) In Steiner's imaginary world, one is in immediate contact with works, as opposed to the real world, where a work's reception is filtered through parasitic secondary criticism. In this society one could hear the Eroica and ponder what it means. One could not, however, enter into a century-long

²² For the purposes of this essay, the term "electronic music" denotes music created with the aid of computers and meant only for direct playback and does not include works which engage with live performance or processing. Likewise, "performed music" is music which comes from a score, rather than is improvised.

print debate as to true meaning of the work. To Steiner, secondary criticism is a "mandarin madness" that "infects thought." (Steiner 1989) He explains that many now learn about art only through these secondary methods, rather than primary interaction. Criticism has created a world where art patrons crave not interaction, but "remission . . . [and] welcome those who can domesticate the mystery and summons of creation." (Steiner 1989)

Susan Sontag attacked criticism with even harsher words in an essay written 26 years earlier. Critical interpretation, she writes, "is the revenge of the intellect upon the word," for "to interpret is to impoverish, to deplete the world in order to set up a shadow world of 'meanings." What matters to Sontag is not what one thinks something means, but the "pure, untranslatable, sensuous immediacy" of interacting with a work (Sontag 1966).

Both Steiner and Sontag argue for primary interaction, yet such interaction is impossible in performed music. Music performances are necessarily interpretative, already once removed from original intent. Steiner recognizes that performers must interpret a work, an effort that is "simultaneously analytical and critical." He believes that this interpretation is not parasitic, but rather tells us more about the work than will any written criticism. (Steiner 1989) Even then, however, his "secondary city" must allow for a secondary, not primary, interaction between music and its listeners. Electronic music, however, can be encountered at the primary level. As Steiner and Sontag imply, this might mean electronic can offer some primal interaction performed music cannot. Here a listener cannot only have a primary interaction with a work, but any critical inquiry is based upon this primary, rather than secondary, relationship.

Musicologist Karol Berger, in an essay on music hermeneutics, notes "there is no such thing as pure experience, uncontaminated by interpretation . . . we are hermeneutic creatures through and through." (Berger 2005) One cannot listen to a work of music without assessing its meaning. One also cannot perform a work without interpretation. Skill in interpretation is highly prized. Music lovers willingly spend much time and money to hear a performer's

interpretation of a score. A Gould performance is prized because Gould inhabits the work. The avid listener enjoys interpretations. A lover of Bach's cello suites is usually not satisfied with one recording, but rather collects many. To my ears Rostropovich's earlier recording is dry, slow, and rigid; Yo-Yo Ma's is exuberant; Casals, perhaps, does best—his is a refined joy. multiplicity of interpretations This has fascinating results. However, the enterprise has a feeling of futility. No matter how great the performance, a listener never hears the composer's voice alone. There is never one "authoritative" recording.

Electronic music, then, could be a primal ground for raw interpretation as a critic may begin study without having to deal with the complex knot of composer, score, performer, and work. This interpretation is not necessarily better or more fruitful than interpretation of performed music, but it certainly might be different. Yet most electronic music scholarship has failed to approach works from a hermeneutic angle. Instead, much scholarship focuses on the process by which a work is created (the trend which Lansky berates in his notes to Ride), and pays no heed to the sound product. The history of electronic music records many "firsts," privileging works that debut a new method. Such history does not encourage interpretation but rather reinforces the idea that electronic music is solely about process, and, perhaps due to a lack of a written score or other more traditional elements of Western music, is beyond interpretation.

Another Lansky work, Smalltalk (1990), takes advantage of the primacy electronic music offers. It deserves critical consideration, even though it is not a "first." In his recording liner notes, Lansky states that Smalltalk "tries to create a new view of its subject, to make the familiar into something special, even ideal" through a "special, ideal" view of an everyday conversation. To do so, Lansky recorded a halfhour conversation he had with his wife. He then wrote software that muddled the sound of the words while maintaining their speech rhythms and intonation, a process he calls "analogous to blowing up the pixels of a colorized photograph so that familiar shapes become abstract squares." The derived speech rhythms are mapped onto a

predetermined harmonic structure, leaving only the faintest hint of the original voice sample behind. Occasionally, a syllable is left intact, and is understandable to the listener, but most of the time the listener is left in a dream state, unable to make out the words exchanged between Lansky and his wife. Lansky cites as inspiration his memories of falling asleep as a child in the back of a car while his parents talked, no longer aware of the content of their speech and only vaguely conscious of their voices' pitch and rhythm. (Lansky 1990)

musical accompaniment The to the fragmented words enhances the feeling. The voices are set to slap bass, raspy showers of high-frequency noise, and a soft, sustained electronic choir. All are mapped onto a fivepitch collection from a mixolydian, and, in one case, dorian scale. The tonal center changes through the work, but in each case, the pitches used are scale degrees 1, 3, 5, 6, and 7. These pitches enforce a root position triad as home to the ears. The sixth and seventh scale degrees do not create harmonic instability, but rather move above a very secure tonal center that changes at a glacial pace when compared to the active voices at the front of the texture. The changes occur during lulls in the conversation, every minute or two. There is no specific formal pattern to the timing or choice of harmonic changes and the shifts are made so smoothly that there is no feeling of harmonic progression, just the sense of gentle shifting every so often.

While the transformed voices of the work are quite active, they impart stillness and tranquility. They fade, rather than speed up when a tonal change approaches. There fast notes do not outline any functional harmony; they offer no prominent leading tones demanding resolution. The fast notes are small bees, flitting from flower to flower, quickly moving yet not really getting anywhere with much haste at all. The choir and bass behind the voices is the cool breeze and warm sun, what Lansky calls a "place to let your ears rest when listening to the music of the conversation." (Lansky 1990)

Lansky writes that the source material for Smalltalk was a conversation about household chores. His hope is not that the listener understand any of the mundane content of the conversation in *Smalltalk* but rather experience the "the spirit, emotions, and music, behind and within" of the conversation. Idle small talk between loved ones means little on the surface, but the comfort, respect, and love beneath are beautiful.

Lansky has based many works on conversation. After Smalltalk, he recorded a series of works based on similarly meaningless discussions with his wife, including Idle Chatter (1994),*just_more_idle_chatter* (1994),and *Idle Notjustmoreiddlechatter* (1994), Chatter Junior (2000). Though all the works sound different from Smalltalk, each transforms a domestic conversation, leaving behind the content in search of the intimate meaning below the surface.

Could a listener get this intimacy from a live, performed work? One could perform Smalltalk using keyboards onto which a computer has mapped the phonemes, chorus tones, and bass notes that make up the piece. Any performance, however, would sound different than the original recording: rhythmic and dynamic values of the pitches would change, even if by accident or on purpose, or a performer might highlight a part of the conversation he finds special or thinks is important. Though this work could be performed, it should be left to compact disc and living room speakers. A performance of this work would remove its content from its intimate, private origins. A listener would no longer hear the conversation as Lansky made it into music, but instead would hear a version of that conversation. Even if Lansky were to perform this work himself in his home for his friends or his wife, its meaning would change. A listener would no longer eavesdrop on marital small talk and catch a glimpse of Lansky's feelings towards his wife. The going-nowhere-ness of the work might, in performance, feel like it was headed somewhere, giving this moment of nothingness too much moment. The intimacy Smalltalk affords is possible only because it is electronic music; performing it would shatter that intimacy and the kind of criticism it allows.

This realization highlights the saddest part about Lansky's recent revelation that he is finished composing electronic music. (Wakin 2008) Lansky's works are, to my ear, some of the best examples of a communication possible only through electronic music. Perhaps Lansky will accomplish similar feats in acoustic music. Regardless of his future, it is now the job of listeners and critics to peer into electronic music's past and present and focus on what is valuable and special about the products of, and not just the processes behind, electronic music. There is a world of meaning to discover, which Lansky's music has helped to reveal, and the history of electronic music must be reconsidered, and perhaps rewritten, with this meaning in mind.

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Georgia State University Computer Music Concert

Review by Jonathan Turner Georgia State University johnturner@me.com

In late November of 2011, Georgia State University (GSU) presented its first concert dedicated to electroacoustic music by student composers. Students under the direction of Tae Hong Park composed and curated a concert featuring *musique concrète* works. For many of the students, this was their first composition.

In addition to student works, guest composer Paul Botelho and electro-acoustic luminary Jon Appleton were also featured. Both composers presented tape works and also performed pieces that integrated live electronics and performance. Social issues played a strong part in some of the student compositions and also in one of the guest composer's works. For the former, the hotly debated execution of Troy Davis served as the focal point for two pieces.

setting was The the Digital Arts Entertainment Laboratory (DAEL), on a rainy day at GSU's sprawling urban campus. Primarily a film studio and laboratory for multimedia artists, the facility sports a large staging area normally used to shoot music videos. Engulfing the stage was a room-sized green screen that served as a backdrop for the audience. A large window looking out at the city was centered behind the stage and gave an interesting visual context to the programmed pieces, especially those that dealt with Davis' execution. It was not lost on anyone that the same window overlooked the location where, just weeks before, massive protests surrounding the issue had taken place.

Jon Appleton's *San Francisco Airport Rock* (1996) for fixed media opened the concert. Amid swirling layers of tonal wash generated by a Roland synthesizer, quotes from interviewees on the topic of "new electronic music" created rhythmic and textural motifs. The question was posed by Appleton to various travelers in a San Francisco airport. The reactions ran the gamut from genuine disdain to joyous enthusiasm with general ignorance of the topic as the average. Two repeated motifs are utopian optimism in regards to the new sounds and a feeling of dehumanization of sonic art. Appleton plays these two motifs against each other, weaving with subdued "synthesizer pads." them Interestingly, the distinction between electroacoustic music and electronic dance music seems to be a subtle point in the work; often times, people who reacted negatively to the question seemed to think that Appleton was referring to the latter. In an almost selfdeprecating manner, the piece ends with a repeated intoning of the phrase "it sucks," the speaker negating other reactions until finally having the last word.

Studies in Noise (2011) by student composer Leland Woodward deployed everyday noises to create a dense sonic landscape. In an almost meditative fashion, sound objects in this world unfold slowly, allowing the listener to probe the morphological depths of the aural landscape at an unhurried pace. Woodward invites the listener to consider each sound and its relationship to everyday life; fragments of familiar sounds such as running water and automobiles almost beg the audience to try to imagine these sounds as being captured from a single location. The piece is highly episodic with each section having a clear beginning and ending both of which abide by the work's inner logic of slow unfolding. Ultimately, all textures dissolve into near white noise, which ultimately fades away in mimicry of its component parts.

Solo for Voice and Computer (2011) broke the programmatic theme of fixed media and brought the evening's first live work: the dynamic vocalist and composer Paul Botelho from Loyola University in New Orleans. gestures Botelho improvises vocal and manipulates them on his laptop with various digital processes in real-time. The composer is firmly entrenched in the extended vocal technique tradition: growls, overtone manipulation, stutters, tongue clicks, and all

manner of noises accessible by the human voice are in abundance. Periodically, this is interjected with piercing counter-tenor melodies that combine Renaissance purity of tone with Botelho's firm grounding in 20th century harmony. Throughout, Botelho's juxtaposition of pure singing tones and more abrasive extended techniques provided a sort of thematic basis upon which to organize the improvisation.

Hearts of the Innocent (2011) is the first piece on the concert that deals with Troy Davis' execution. Composed by Kim Huong-Ruiz, a junior who recently transferred from University of Georgia to GSU, the work opens with a fanfare of car horns and descends into the faint echoes of Davis' voice. A reading of Davis' final statement serves as an undercurrent throughout, as samples recorded from the various protests occupy various foreground focal points. The commentary is decidedly pointed and ranges from arguments against the death penalty to outright vitriol at the judicial establishment, going so far as to including a sample of a man saying "at least they killed ... a cop." Delay and filtering techniques applied to the voices creates a complex sonic tapestry that is musically intriguing while keeping the commentary at the fore. Ominously, the work ends with a jaggedly unpolished rendition of the Harry Dixon Leos's gospel song This Little Light of Mine as a church bell rings before fading into nothingness.

The mid-point of the concert saw Jon Appleton performing his recent work Solitude (2011) for piano and tape. As a bell is struck, digital strings intoning a single note become the background to a haunting solo soprano who in turn gives way to a women's choir. An ominous chord in the piano gives the piece a suddenly introspective air as the first strands of a sentimental melody arise. The melodic strands fall away as a single low tone is struck and the choir from the beginning, so faint before, comes to the fore. While the digital chorus sings in the background, Appleton speaks a tribute to his friend and mentor Max Mathews. This was, by far, the most touching moment of the concert. While many of the pieces focused on the darker elements of human nature in an abstract sense. here was a man speaking a eulogy to his good friend. The chorus fades as the piano resumes its

melodic weaving, carrying each strand of melody to the piece's reverent conclusion.

Untitled (2011) by Geoffrey Massey stands out in the concert as being the only piece with a clear programmatic narrative bringing back memories of Gilles Gobeil's La Ville Machine (1992). Foregoing heavy processing and manipulation, Untitled instead opts to recreate the aural experience of a sword fight in the snow; the piece is as much an exercise in the art of foley as it is a musical composition. The heavy pulse of a heartbeat runs throughout as sounds of snow crunching under the combatants' feet create a sense of cold tension. Swords clank and snow is shuffled as the fighters engage one another until one is crowned victor with a nearly silent freezing stab and retreat. Heavy breathing and lush vet ambiguous synthesized chords give the piece its uneasy conclusion.

Cuddle and Coo (2009) was the second piece from guest composer Paul Botelho. Returning to the topic of cultural conception, the work concerns itself with reactions to the controversial "Cuddle and Coo" doll from Fisher Price that was alleged to have chanted the phrase "Islam is the light." The doll itself is a center piece in the sound design, manipulated and looped in such a way as to make any vocalized impression intentional or not readily apparent. Simple harmonic structures are layered under various verbalized opinions on the doll, all of which express some form of disapproval. Like the reactions to Davis' execution in Ruiz's Hearts of the Innocent, the reactions to the toy are varied in their level of disapprobation. These vocal samples are processed and deftly woven into the work's textural outline with the reemergence of the controversial phrase serving as a formal marker. However, as in Appleton's piece, the doll, rather than the composer, gets the final word.

Five (2011) by percussionist Madeleine Conti in her junior year sonifies the familiar feeling of time between hitting the snooze button on one's alarm clock. The piece begins as though waking from a dream, fading in textures and nature sounds before a piercing alarm clock comes to the fore. A hand slapping the snooze button begins a journey through the halfway state of conscious and unconscious as imagined in a soundscape of jumbled sonic references. As the listener metaphorically falls deeper into sleep, the aural landscape slows and seems as though it will offer a moment of respite; this hope is ultimately futile however, as the listener is plunged yet deeper into a swirling mass of sonified subconscious. The vaguest sense of a train scene is established with the sounds of a train conductor yelling loudly over metallic grinding sounds. This moment feels somewhat eerie as the auditory scene almost feels like one has been given a faint window to briefly peeking into the memory of the subject. This grinding eventually envelopes the vocalization, growing ever louder before morphing back into the alarm clock. A final slap ends the piece.

Too Much Doubt (2011) by graduate composition student Alex Marse is the second of the two pieces dealing with Davis' execution. In contrast to Ruiz's work, however, the vocal samples tend to deal with the subject matter in a more general way; the piece feels less like a protest and more like a meditation on the death penalty itself. FM synthesis textures and heavy processing of vocal samples obscure some of the phonemic content of the words while blending the voices into the sonic fabric. More striking, however, are those samples that are not processed as clarity of the words contrast the overall cacophonous background texture. The meanings of these unprocessed phrases make up the motivic framework of the piece itself and although the phrases deal heavily with issues of class and race, they ultimately tend to lack some of the acerbic rhetoric that was common around the issue during the Davis protests. Nowhere is the contrast of abstracted and untreated sounds more readily apparent than during the piece's climactic gesture. Here a man speaks passionately, but calmly, as a ringing pitch is transformed into the sound of an EKG flatlining, the final pitch ringing for quite some time before finally fading away.

Though the music technology program at Georgia State University is not new, involvement in electro-acoustic composition has only recently seen a spike of interest amongst the student body. This concert, the first in what is planned to be an event-taking place at the end of every semester, provided an outlet for students to hone their craft. There was a palpable air of excitement after the concert and much of the reception conversation was directed towards future plans in the area of electro-acoustic music. If audience reaction is the main metric by which a concert's success is measured, then this event was as successful as any of its genre. However, in the larger scope of encouraging young composers to present creative works, this concert was nothing less than a triumph.

Iniquity and Sunshine

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In 1850 Nathaniel Hawthorne published The Scarlet Letter. For an American novel so committed to unraveling the aftermath of forbidden passion, the coitus occurs offstage before the first chapter. Readers receive none of the affirmative benefit of Hester Prynne's courage, or the character of her own thoughts as she embraced risk to experience intimacy within a repressive society. What readers get instead are first chapter descriptions of a prison door. By chapter two a member of the crowd shouts at Hester to enter the marketplace:

"A blessing on the righteous colony of the Massachusetts, where iniquity is dragged out into the sunshine!"

Iniquity and sunshine. In the Boston of Hester Prynne's time the conflation of moral decay and bright daylight was thought to provide an antiseptic effect. During Hawthorne's own time, the marriage of the Industrial Revolution and modernist culture put such antiquated notions in doubt. Hawthorne's mid 19th-century America saw the signing of the Fugitive Slave Act, which allowed for the return of slaves found in free states. It saw the encroachment of the government onto native lands legitimized through the Sioux land treaties, which "stipulated and solemnly agreed" that peace between the United States and the Indians would be "perpetual." Hawthorne lived to see the election of Franklin Pierce to the U.S. presidency in an election cycle that included the anti-immigration xenophobes known as the "Know Nothing" party. Iniquity, as it turned out,

could thrive very well in broad daylight.

In 1864 Union General Tecumseh Sherman ordered the burning of the city of Atlanta, GA. By September 2, 1864 the city of Atlanta surrendered to the Union army. The surrender of Atlanta was an important step towards final Union victory.

The same year as the publication of *The Scarlet Letter* a French artist named Gustave Courbet exhibited *The Stonebreakers* at the Paris Salon. The painting was considered a display of poor taste due to the fact that it awkwardly revealed the plight of common laborers. A man too young to be working so hard is assisting a man too old to be working so hard. The two figures crowd the front of the picture plane making them incredibly close by French salon painting standards. They are painted life size as well, so it is possible to feel the sound of the hammer making contact with the stone.

The painting was last seen in the Dresden Kunsthaus and was presumably destroyed during the Allied fire bombings of Dresden in 1945.

American soldiers from the 423rd Infantry Division were being held as prisoners of war in an underground meat locker during the bombing of Dresden. One of soldiers was a thirdgeneration German-American from Indianapolis, IN named Kurt Vonnegut. In 1969 he wrote a book called *Slaughterhouse Five* based, in part, on his war experience.

In 2000 artist Paul Pfeiffer showed a series of moody photographs of a desolate beach. At first glance the photos appeared consistent with heavily mediated fin de seicle image makingmannered emptiness rendered lush and large. Blurred backgrounds deflected attention to empty foregrounds. But close inspection revealed more. It was possible to see footsteps in the wet sand, footsteps that end without explanation. The images were soaked with gorgeous light and vintage color processing broke middle values down into mud and magenta. It took many viewers generous amounts of time to realize that the images were appropriated versions of George Barris photographs of Marilyn Monroe from 1962.

It's tempting to think that Pfeiffer's representation of those beach scenes without Marilyn Monroe was an attempt to impose tragic subjectivity onto indifferent soil. In fact just the opposite it true. The water and sand existed that day apart from Marilyn. The images collapse back down into their empirical ingredients: lens, light, and landscape. Nothing in Pfieffer's image can possibly know that the day of the photo shoot back in 1962 was Marilyn's 36th birthday. Nothing could know that she was exhausted and disappointed and struggling through her last film, prophetically titled Something's Got to Give. The sand and water of that beach could not know that Marilyn had been fired then re-hired, or that the film would never be completed because Marilyn Monroe-who had sung "Happy Birthday" to the president weeks earlier--would soon be dead. The emptiness of Landscapes Pfeiffer's doesn't avoid sentimentality so much as they suspend it in amber. The pathetic fallacy we might wish for offers no surface onto which we can grasp, only a digital phantom on photo paper. The sunlight drenches the ground around Marilyn's footsteps as if she was never there at all, as the act of dving gently erased her from our representations.

In 2005 Jonathan Safran Foer published the book Extremely Loud & Incredibly Close that was about an eccentric boy dealing with the loss of his father during the collapse of the World Trade Center. The premise paid homage to The Tin Drum by Gunter Grass, among other sources, and the book was heavily praised in the popular press and roundly criticized in the literary press. However, the 9/11 events are not mentioned directly until very late in the book. It's not even until page 69 that Foer lets readers know the nature of the trauma that the young extension, the reader-is boy-and by attempting to process. On page 273 Foer gives a laundry list of the job descriptions of people who died in the towers on 9/11. On that list is the term "artist-in-residence." The World Trade Center had initiated an artist in residence program in 1997 in Tower 1. The program was begun in part by Graham Nixon, a painter teaching at the New York Studio School and was administered by the Lower Manhattan Cultural Council. On September 11, 2001 an artist named Michael Richards was in his new studio in Tower 1 when it collapsed. He had been an art handler on the free-lance art handler circuit in New York when I first moved to the

city. I met him one time at an event in early 1994. I was a not friend to him, nor even a real acquaintance. I mainly remembered him because he had the same name of a comic actor of the time. And yet when I read through Foer's list of deceased professions on page 273, the term "artist-in-residence" created within me a dim emotional bruise. I instinctively root for all struggling artists and I was rooting for Michael Richards as well. I am sorry he had to die that morning.

In September 2011, artist Craig Dongoski, with the help of architect Tim Nichols, collaborated to produce an exhibition event called "9-11-10 (Strangers & Neighbors)" in the university gallery space at Georgia State University in Atlanta, GA. The exhibition readily announced its component parts. It included looped video projections of a clouded sky, two columns of speakers with a suspended globe, and a continual audio recording. The speaker stacks echoed the form of the World Trade Center as they provided the space with sound. Their form was a blend of both function and retro aesthetic. The sound itself was a constant room-filling drone, sometimes with recognizable clarity and other times fading into background static. The sound was recorded and modulated by Dongoski from the George W. Bush's post-9/11 speech, fire and police airplane engines. recorded scanners, conversations, and Obama's speech after the capture of Bin Laden. The destroyed twin towers become reborn as an aggregate of mismatched speakers, tirelessly announcing the conditions of their antecedent's demise. The video projected onto the gallery walls were taken of the sky straight above, but when projected horizontally on the wall the clouds referenced smoke from ground zero.

The gallery room was lit only from the projected video and the sound recording absorbed all other activity. The elements provided only the most basic clues to content: a re-positioned sky, sound from a disaster site, and two towers of speakers.

As with *The Scarlet Letter*, the event has already occurred and now we were presented with the aftermath of two planes that took off that morning from Boston. Minoru Yamasaki's Twin Towers, like Courbet's *Stonebreakers*,

were destroyed by enemy attack and have now reassembled themselves from audio parts in a gallery in downtown Atlanta. Like Paul Pfeiffer's photographs, the exhibition "9-11-10: Friends and Strangers" is not prodding viewers to re-live trauma. Instead, it isolates the trauma by underscoring the banality that frames it. The sky above the New York on September 11, 2011 was the same sky from any other fall morning just as the sand on the beach in 1962 was ordinary sand whether Marilyn Monroe stood on it or not. The sound coming from the speakers in the exhibition was an aural stew of institutional protocol, political posturing, and pedestrian reaction-material so familiar because it has become the backdrop for contemporary life. "9-11-10: Friends and Strangers" may have been about American trauma crystallized in New York City, but the exhibition took place in a city that, like Dresden, had been set on fire in military battle. The complexities of site, representation, and memory collapse back down into empirical parts as trauma gets distilled through representations never fully up to the task.

Bent Frequency presents: *The Music of Jennifer Walshe*

Review by Alex Marse Atlanta, Georgia aemarse@gmail.com

Jennifer Walshe, who received her D.M. in Composition from Northwestern University, often includes both audio and visual components in her works. On her artist page on the Contemporary Music Centre of Ireland website, Walshe remarks, "The sounds I am interested in include those that we hear all the time but are normally considered flawed or redundant" (Contemporary Music Centre 2010). Her second work on this concert, *Atlanta 2089* (2011) especially expresses this notion, as some of the instruments used in the program include items such as a teddy bear, apples and oranges, a typewriter, playing cards, and a Lego set.

The concert began with *XXX_LIVE_NUDE_GIRLS* (2003), which is

modeled after the marionette opera tradition that was popular in Europe during the eighteenth century. Walshe writes on her website, "The marionettes are fashion dolls of the Barbie or Cindy type and their 'theatre' is a large doll house" (Milker Corporation 2012). A video displaying the dolls and their accessories is projected onto a screen behind the stage, where the manipulators' hands are clearly visible, emphasizing that the storyline reflects how an average Barbie doll user might play with their dolls. The opera is much like a modern day reality television program, providing the audience with an inside look at Barbie's daily activities.

Scene 1 introduces the three main Barbie characters, Camille, Gloria, and Naomi, as they meet at one of their houses to drink wine and discuss their day. Muffled phone conversations are interrupted by sharp staccato trumpet sounds, key clicking sounds, and extended vocal techniques performed by Walshe; she uses a tape recorder on stage to record parts of the conversations and plays them back into the microphone. Conversations between the three dolls are quietly whispered, melodically sung, and occasionally piercingly screamed. The mention of a dinner party brings silence, interrupted by short, high-pitched notes from an accordion. Finally, the chaotic conversation returns at full blast, accompanied by the glissandi of a muted trumpet and the strumming of a subtly detuned acoustic guitar. A long section of silence ends the scene, interspersed with the provocative moaning sounds from the three Barbie characters.

In scene 2, the Barbies' "boyfriends" visit their home. As the characters argue with one another, long sustained tones on the trumpet and accordion provide a soothing contrast to the aggressive nature of the fight between the group. This soothing sound, however, is interleaved by occasional synchronized outbursts of harsh timbres, which bring the ensemble together with a descending major triad arpeggio. Meanwhile, the cello plays a dissonant, rhythmically sporadic succession of notes using a Barbie doll as a bow. As silence once again falls, an automobile engine is heard and car sounds flood the hall. Arguments are now abound, and the frustration with their relationships is heard in phrases like "I wasn't trying to control you, I was just trying to get you to listen to me." Complimenting one another, the sounds of screeching tires mix piercingly with the crescendo of a trumpet. When the car finally stops, one of the Barbie characters is pushed off of the roof by her boyfriend.

The final scene begins as the sounds of the car fade out and a surprisingly out of place traditional folk melody is played by the ensemble. The sounds of choking and squirming eventually accompany the music, providing a texture that is even more disjointed than the one that accompanied the arguing in the previous scene. In a violent turn of events, boyfriend Mike rapes his girlfriend on screen while the "happy" folk melody continues to provide an eerie sonic contrast. The music then stops suddenly, mid-phrase, and the Barbie character unexpectedly proclaims, "I love you." After over a minute of complete silence, the audience hesitatingly applauds, breaking the awkward tension created by the absence of sound and the motionless performers.

After a short intermission, *Atlanta 2089* is set to begin. Walshe counts down from three; and the piece begins with the striking of a bell, an action which similarly marks the beginning of a meditation session in the Zen Buddhist tradition. Soon after the ringing of the bell subsides, Walshe recites a futuristic memoir as trumpetbreathing sounds provide a wave-like texture underneath her voice. Walshe's words speak of a culture's scientific achievements, reflected in statements such as, "We constructed perfect geometries in the hope that they could tear holes in the fabric of space and time."

Beautifully sustained major harmonies fade in from the silence accompanied by waltz-like minor chordal harmonies played on a keyboard. Walshe sings a flowing melody emphasizing the words "cross it out," as sound samples spoken in different languages provide a layer of tension and uncertainty. This texture fades into the background, and a performer on stage begins reading quotes from martial artist Bruce Lee's film *Enter the Dragon* (1973).

A sudden burst of pre-recorded, rhythmically complex kung-fu chop vocalizations breaks the quiet reading, while Walshe recites the phrase, "I'm in your basement killin' your dudes," a video-gaming catch phrase referring specifically to the combat simulation video game *Call of Duty*. The whole ensemble joins in the recitation, and the phrase is formulaically adapted to address different topics, such as sex, religion, the Internet, Facebook, masturbation, pornography, and yoga.

A ringing bell brings in a new section of silence, marked by breathing sounds created by the trumpet. Walshe reads more absurdly futuristic quotes from an unknown source including "we inhaled radio transmissions and text messages" and "we prayed for the singularity." Her reference of the coming technological singularity, in which our technological creations become more intelligent than the humans who created it, makes her disillusionment with modern culture's dependency on technology very clear.

A loud, dissonant chord on the organ interrupts Walshe's calm readings. In response, she utilizes her extended vocal techniques to create a more sporadic and chaotic vocal sound that suits the grim lyrical content. She then matches her voice with the trumpet glissandi in the background. As the trumpet and saxophone begin to squeak and sing, Walshe rattles off seemingly random numbers and coordinates that suggest data from scientific experiments before fading into another silent moment.

The striking of the bell once again begins a new section, accompanied by more quotes by Bruce Lee. Walshe then begins to speak about the "meme," a reference to the type of modern day concepts that spread over the Internet and social networking. Walshe sarcastically refers to the meme as "a biological sculpture of exquisite elegance" that is "the universal artwork of our species." As the piano recirculates the minor harmonies that were introduced earlier. Walshe exclaims bouts of "glam rock" style vocals. As usual, her lyrical content provides a morbid contrast to her singing style, addressing the topics of rape, murder, and death. An FM synthesis texture rises from the chaos: the tones simultaneously rise and fall in pitch in a manner similar to James Tenney's For Ann (rising) (1969) and John Chowning's Stria (1977).

As the tones drop out, Walshe begins to rattle of instructions for playing a *Donkey Kong* video game. On stage, pianist Peter Marshall frantically tries to write the instructions on a dry-erase board. Walshe's explanation of the game, which describe instructions for finding "golden bananas" and giving them to a monkey in order to advance, sound comical when explained out of the context of gameplay.

A new section begins with stuttering vocals addressing the limited duration of human life and our tendency to waste so much of it on meaningless activities. The various instruments in the ensemble play a pulsing and dissonant succession of chords until Walshe finally questions, "When the body dies the soul dies with it?"

The final section of the piece features murky guitar chords and long, drawn out tones on the cello. Rising FM synthesis tones fade in, strongly complementing the sad and hopeless texture created by the guitar. A recording of someone talking about prolonging human survival and our dependence on religion is scattered throughout, but the fragmented speech samples only yield incomplete messages. Finally, the rambling vocal samples end as the guitar chords slowly fade into nothingness.

Jennifer Walshe brings a creative and refreshing compositional voice to the world of new music. Her works are more than just abstract musical compositions: she uses mixed media to supplement her music with relevant social and cultural criticism, providing the audience with a clearer understanding of her message. Though her works XXX LIVE NUDE GIRLS and Atlanta 2089 she critiques familiar topics of modern culture's superficiality and obsession with technology, and she does so in an unconventional and unique way, providing an alternative view on these important issues.

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EarZoom Sonic Arts Festival 2011

Review by Miha Cigla IRZU, Ljubljana, Slovenia miha.ciglar@irzu.org

Introduction

This paper outlines the context surrounding the EarZoom Sonic Arts Festival, focusing on the festival's 3^{rd} edition, which took place September 30–October 4, 2011, in Ljubljana, Slovenia. A selection of featured works/events from the festival will be briefly reviewed here and put in relation with the general objectives of the festival's host, IRZU – The Institute for Sonic Arts Research, based in Ljubljana.

The first EarZoom festival took place in 2008 under the direction of Miha Ciglar, the founder and current director of IRZU. Over the past three years, EarZoom has featured performances, exhibitions and installations by established international composers and artists. Each year, the festival has also included workshops and lectures covering a wide selection of topics concerning electronic music, ranging from mobile music production to hardware hacking. While EarZoom promotes these activities within the Slovenian cultural space, IRZU – a nongovernmental organization (NGO) – is working to establish an innovative model for cultural management in the European Union.

Vision and Mission

IRZU was established in 2008 and is based on an interdisciplinary concept, conducting artistic productions in the broad field of contemporary music / sound arts, as well as audio technology research and educational activities. While IRZU is deeply engaged in producing content derived from its R&D activities, it also actively advocates for the inclusion of sound and music computing in Slovenia's public educational system. After a century of development, global affirmation, institutionalization and integration of music technologies in our everyday lives, the field of sound and music computing can now be seen as a basic component providing a solid background for developing artistic aspects in contemporary performance music, and musicology. One of IRZU's main goals is to establish permanent, freely available access to information, knowledge and technical resources regarding this field to local students at artistic academies in Slovenia (particularly composers and media artists) and to other interested individuals as well. As there are no other similar public or academic institutions in Slovenia, one of the EarZoom festival's vital functions is to promote and validate the importance of IRZU's work, which it does by featuring similar, established institutions and researchers from the international academic scene.

Moreover, IRZU aims at creating links to other artistic disciplines, as are clearly reflected in the program selection of EarZoom 2011. Another of IRZU's aims is to establish networks with national and international institutions relevant for its development. There are several national public and private institutions (e.g. Cankarjev Dom, Kino Šiška, Moderna Galerija, Kinoteka, Galerija ŠKUC, Aksioma, Galerija Kapelica, SPLOH, Menza pri Koritu, Ljudmila, BOKS) that are involved in the organization of the EarZoom festival by either offering infrastructural support or producing individual festival program components (events or concert series). In 2011, IRZU joined an international consortium of partner institutions (Music Technology Group - University Pompeu Fabra Barcelona, CRISAP - University of Arts London, Q-O2 – Brussels) in launching the ongoing project "Sounds of Europe". Consequently, EarZoom 2011 became the platform maiden presenting а public manifestation of this project. Moreover, it was the "Sounds of Europe" project that defined the thematic context of this year's EarZoom festival.

Outcomes

Between September 30 and October 4, 2011, the EarZoom festival produced a series of activities and events that presented the works of artists and researchers alike, such as Nick Collins, Atau Tanaka, Adam Parkinson, Tae Hong Park, Eduardo Miranda, Pierre A. Tremblay, Jamie Bullock, William Brent, Matthew Burtner, Johannes Kreidler, Ake Parmerud, Roger B. Dannenberg, Pietro Polotti, Chris Kiefer, Philippe Pasquier, Hans Tammen, and many more. The presentations of their research work were held in the form of workshops, lectures, performances and installations.

Sounds of Europe: Disharmonious Voices

For EarZoom 2011, the organizers shifted the focus from an exclusively technologically inspired concept of sonic arts towards a somewhat wider, socio-political context of contemporary arts. Within this framework, we were reflecting on the expressive potential of sound-based practices. By focusing on one particular segment of contemporary models of artistic representation operating at the levels of the audible and the visible, the project "Sounds of Europe" aimed to create a critical relation towards a normalized fetishisation of sound. Thus it served not only as a medium for recording and processing abstract soundscapes, and multiplying aesthetic diversity in general, but also explored the idea of sound and voice as self-evident realities. The purpose of "Sounds of Europe" was to confront different approaches and motivations in artistic production that are engaged with the notions of sound, voice, the (in)visible and the (in)audible, and to make possible a re-articulation of (European) power structures that often serve to either confer or withdraw legitimacy on selected voices. "Sounds of Europe" also re-examined the commonly accepted understanding of the concept of sound/voice, and furthermore, offered a re-consideration of questions that affect different mechanisms of dominant representations in the fields of the audible and visible

Johannes Kreidler – Product Placements (2008) One compelling piece that was perfectly aligned with the "Sounds of Europe" theme at EarZoom 2011 was composer Johannes Kreidler's live performance event *Product Placements* – a short musical work (33 seconds in duration) containing 70,200 quotations from existing musical compositions. On September 12, 2008, Kreidler registered the piece at the German copyright protection agency GEMA, using 70,200 separate forms. Although a legal gray area in some countries, in Germany, one is legally obliged to send GEMA a form for every copyrighted work quoted in their musical works. Kreidler filled out every single individual form required for this process. For EarZoom, he presented a video document of this action.

Nika Autor – Solidarity (2011)

Nika Autor presented a nine-minute film showing the images of shoes of several people walking in the street. From the soundscape of the recordings, one can tell that they were taken at a public protest/demonstration. The film is actually a re-shooting of Joyce Wieland's 1973 film *Solidarity* and documents worker protests in Ljubljana. It raises such questions as: What is solidarity today? Who is expressing it? Towards whom, and when? The idea for re-shooting the film emerged alongside the current horrifying exploitation of labour, mass unemployment, impossible work conditions, restructuring of the labour market and the question of solidarity being manipulated by the structures of power.

Nicolas Collins – Workshop and Performance

Another important event during EarZoom 2011 was the work of artist and composer Nicolas Collins. Collins offered a short but very inspiring workshop that was especially relevant with regard to IRZU's general education agenda. Assuming no technical background whatsoever, the workshop guided the participants through a series of sound-producing electronic construction projects, including:

- The construction of alternative microphones (contact microphones, coil pickups, using speakers and headphones as microphones, tape heads, binaural mics, etc.).

- The construction of a "Victorian synthesizer" (making an oscillator with just a speaker and a battery).

- The "laying of hands" on a radio circuit board (the poor man's Cracklebox).

At the end of the workshop, seven participants formed an ensemble that performed the composer's piece *Salvage*, a performative piece in which they attempt to re-animate deceased and discarded electronic circuitry: cell phones, computer motherboards, fax machines, sound mixers, musical keyboards, etc. Six of the players used test probes to make connections between a simple circuit designed by Collins and the electronic corpses; feedback between the circuit and the components on the dead board produced complex patterns of oscillation that constantly changed in response to the slightest movement of the probes. The seventh performer "conducted" the performance by periodically signaling the players to try and freeze the current sound texture by holding their probes as still as possible. The intro to the piece was performed by Collins himself – a solo on a battery-powered vent stimulating a flickering candle that in turn controlled the tuning of oscillators on another circuit board.

Conclusion and Future Directions

EarZoom 2011 featured a condensed series of public events that generated a lot of media attention as well as positive feedback from the local audiences Although the festival has grown in size over the last three years, this has been mostly due to enthusiastic contributions by the organizers themselves as well as international support - i.e. many featured artists securing their own funding in order to participate. Partly due to the international visibility of the festival, IRZU has recently managed to attract the attention of the International Computer Music Association (ICMA), which selected IRZU to be the host of the International Computer Music Conference (ICMC) 2012. Thus, the largest and oldest international conference on computer music will be held in collaboration with the next EarZoom festival in September 2012 in Ljubljana, Slovenia.

Despite the apparent success of IRZU's initiatives to introduce electronic music / sound arts research to the local environment, the availability of national funding resources for these purposes is not likely to be improved in the near future. Considering the recent political developments - e.g. the right-wing political parties having just formed the new government coalition (despite being defeated at the elections!) – we expect the arts funding situation to get even worse than it currently is. In fact, one of the first official acts of the new government has been to shut down the Ministry of Culture currently IRZU's main funding resource - that clearly announces the upcoming attitude towards culture in Slovenia.

In light of the difficult times coming up, it ought to be mentioned that the scientific research at IRZU is oriented towards technologies that not only can be used in an artistic context but that also exhibit a commercial potential. This is one strategy through which we are actively working towards establishing an alternative funding resource for promoting contemporary arts and music in Slovenia. In 2011, IRZU founded a spin-off company, *Ultrasonic Audio Technologies*, with the aim of marketing and commercializing some of its products and research results.

At the moment, the organizers of EarZoom are still looking forward to an exciting event coming up in September 2012; however, only time will tell IRZU we will be able to keep the EarZoom festival – as well as all of its other public events that take place throughout the year – still running in 2013.

2011 Margaret Guthman Musical Instrument Competition

Review by Nathan Weitzner Georgia Institute of Technology nweitzner3@gatech.edu

The Margaret Guthman Musical Instrument Competition is becoming one of the world's most prestigious events for new musical instruments, offering a total of \$10,000 in cash prizes. On February 24-25, 2011, the Georgia Tech Center for Music Technology (GTCMT) hosted its third annual competition. Details about the competition are available at the GTCMT Web site (http://www.music.gatech.edu/event/2011margaret-guthman-musical-instrumentcompetition-finals).

The 2011 competition drew many talented instrument makers and included 24 applicants from a total of seven different countries. The judges included Tom Oberheim, inventor of the first polyphonic music synthesizer; Sergi Jorda, inventor of the *Reactable*; and Jason Freeman, professor of Music Technology at Georgia Institute of Technology. The instruments were judged on novelty, musicality, design, and engineering. After extended discussion and deliberation by the judges decisions were made regarding each instrument. The competition consisted of preliminary presentations from the competitors, followed by presentations and performances by the finalists. Each competitor was provided an opportunity to present their instrument and also answer questions from the judges.

The first day of the competition took place in the Couch Building, home of the Georgia Tech Music Department and GTCMT on the far west side of campus. After registration, the competitors were each given their own sound system inputs and a space to set up. Rather than having each competitor perform on the same stage (a logistical nightmare given the nature of the instruments), the audience and judges went to each of the competitors.

The instruments were all across the board in terms of interaction and sound. Traditional instruments and well-established performance paradigms inspired some, while others attempted to explore novel methods of interaction. One commonality shared among the competitors was the amount of thought, creativity, and passion, which was evident in their creations.

The first day ended with an informal jam session where the competitors tried out each other's instruments and engaged in discussion. Given the impressive quality and ingenuity of the instruments presented on the first day, it was clear that the judges were going to face some very difficult decisions.

The second day was held in the Architecture Building located at the heart of Georgia Tech. Stationed in the central atrium of the building, several competitors and instruments captivated crowds of curious students who were passing between classes. One such instrument was Richard Logan-Greene's Submersible, which consisted of several tuned pipes affixed with various actuators suspended by servo-controlled pulleys over a tank of water. Additionally, Ben Neill presented the most recent version of his Mutantrumpet then incorporated electronics while collaborating with Robert Moog. The Mutantrumpet is an instrument that has been evolving since the early 1980s, and it began as a combination of three trumpets and a trombone. In the tradition of Henry Cowell and John Cage, Per Bloland's Electromagnetically-Prepared Piano utilized an array of computer-controlled transducers to resonate its strings. After the completion of the first round, the judges deliberated and the finalists were announced.

The finalists performed that evening in the Reinsch-Pierce Family Auditorium and Stubbons Gallery at Georgia Tech. While the preliminary rounds allowed competitors to demonstrate and discuss their instruments, the performances allowed them to demonstrate the musicality afforded by their instruments during performance. A reception was held while the judges deliberated, and the winners were announced thereafter.

Leon Gruenbaum was awarded third place with the *Samchillian Tip Tip Tip Cheeepeeeee*, an instrument consisting of a modified QWERTY keyboard and a software component. Each keys represented a relative change in a given set of pitches, allowing the user to focus on higher-level musical elements such as melodic contour and note density.

In second place was Christian Graupner, who presented his *MindBox*, which was part installation and part musical instrument. The interface was a repurposed lever slot machine connected to a large display. The traditional "scrolling fruit" of the reels were replaced by video loops containing dance and beat-boxing performances by choreographer Roberto Zappalà. Audience members were able to interact with buttons and levers on the machine to control and rearrange the vocal and gestural performances.

The winner of the \$5,000 grand prize was MO, presented by Interlude Consortium with Frederic Bevilacqua and Julien Bloit of IRCAM. MO was a tangible interface equipped with a three-dimensional accelerometer and a threeaxis gyroscope designed to capture, process, and wirelessly transmit gestures. During their performance, they recorded several vocal and percussive sounds while simultaneously making gestures with the instrument, thereby associating the recorded sound with the gesture. MO was then placed inside several objects including an eggbeater and a foam soccer ball, which were tossed around by the audience. The performance was engaging, well received, and the Interlude Consortium effectively demonstrated the versatility and expressivity of MO.

The 2011 Margaret Guthman Musical Instrument Competition was a wonderful, two day event that brought together some of the world's most innovative makers of new instruments. These inventors continue to push the boundaries of musical possibilities.

New Music New Orleans

Review by Paul J. Botelho New Orleans, Louisiana pbotelho@loyola.edu

The first New Music New Orleans concert was held on April 28, 2011 in Roussel Performance Hall at Loyola University New Orleans, and featured new works by Loyola students and faculty, Tulane University faculty, and guest composer Jon Appleton.

The evening began with Humans are Like Ripples (2009), a piece for mixed ensemble and fixed media composed by Loyola student Devin Hildebrand. The composition featured recorded interviews in which respondents rated how they felt on a scale from one to ten. The recorded interviews then served as the "score" for the work where responses represented pitches of a diatonic scale which heralded in new recorded and live performed tones. The piece artfully presented an algorithm that is easily comprehended but nonetheless expressive both in an intellectually stimulating and emotionally satisfying fashion.

The next piece on the program was Tae Hong Park's *Aboji* (2001) for fixed media. Park, at the time of the concert a member of the Tulane faculty, presented the work, which is a companion piece to his earlier work *Omoni* (2000). The piece is composed of intertwined recorded interviews with sounds that echo the central theme of the work, father. A plethora of sounds back the interviews, drawing the audience in to the fragmented spoken stories.

Like Us (2011), for three flutes and voices, by Loyola senior Sebastian Valenzuela followed. The work was comprised of two independent components, the voices and the flutes, which were performed in parallel. Long drones were sung by the vocalists, countered by expressive lines by the flutes. Bhob Rainey's *A Desert of Consolation* (2006) for fixed media was next on the program. The piece, as stated by Loyola faculty member Rainey, "...explores a simple formal movement in which one low-velocity, low-bandwidth section peels open another, more effervescent layer of sounds and events." The densely layered work subtly shifted creating a dark, hypnotic space that washed over the audience.

Loyola senior student Monty Goulet next performed his piece *Sakusofone Ongaku* (2011) for saxophone and fixed media. The live component of the piece was composed of 15 melodic fragments in "the style of melodies used in Japanese saxophone literature" which are randomly played by the performer. The fixed media component, created from manipulated saxophone recordings, produced a dense, everchanging swirl of sound, above which the melodic fragments soared.

Devin Hildebrand next presented two "glitchbased" works composed using sounds taken from pornographic videos, *Wwet* (2011) and *Wwhat's on my hands*? (2011). The pieces, frantic in nature, began with explicit samples that were quickly manipulated into manic, assaulting figures. Hildebrand's composition played with the idea of the obscene, deconstructing the pornographic sounds into musical building blocks.

The Electro-Acoustic Ensemble (EAE) performed an improvisation next. The ensemble, founded by myself in 2009, is composed of 13 laptop performers utilizing custom ChucK and Java software instruments which I developed. The ensemble performed a keyword-based improvisation. The keyword, undisclosed to the ensemble until performance time, described the overall shape and direction of the piece. Performers were asked to recite "stream of consciousness thoughts" relating to the keyword throughout the work. Various software instruments were used, including the EAE Sampler, a real-time sampling and manipulation instrument, and the Amerikin Dream, an amplitude modulation instrument that is controlled via gamepad interfaces. The keyword used for the piece was "death" which resulted in a dark soundscape punctuated with spoken passages relating to fear, the macabre, and acceptance.

Jeff Albert, Loyola faculty member and Ph.D. candidate at Louisiana State University, performed his piece *Peter's Mountain for Improvisor with Computer* (2011). The work was a real-time improvisation between Albert on trombone and the computer. The computer led the improvisation by "dynamically generating the melodic and rhythmic content of the piece," forcing the improviser to "react musically within the sonic space presented by the computer."

De Zoe (2003) by Tae Hong Park for solo cello was performed by Maxim Samarov, conductor of the Tulane University Orchestra. The piece began with percussive stomping, a precursor to the main exploration of the work, and quickly fell into a juxtaposition of hectic cello lines and the rhythmic percussive stomping. The piece built to an aggressive, double-stop heavy, dance-like section only to fall into a melancholic descending melody. An exploration of harmonics brought the piece into a new space where the double stops were once again introduced. A static melody emerged and devolved into low glissandi punctuated with a of the rhythmic return stomping. The performance of the piece was both beautiful to listen to and watch. It displayed a wonderful interplay between physical movement not often associated with the solo cello repertoire and an ever-changing tonal and timbral landscape.

Plato's Cave (2011), by Loyola student Elliot Downey, is noted by the composer as "a sonification of the Allegory of the Cave from Plato's *The Republic.*" The piece, for fixed media, began with a cacophony of distantly reverberated voices waxing and waning, moving to a complex rhythmic texture of highly transient sounds. The distant voices built again, exploding into a radiant wash of sound. The voices were then brought into focus, streaming an array of ideas and thoughts, and finally subsiding into a soothing, wind swept texture that rippled outward, marking the end of the piece.

My works, *trumpet study* (2010) and *contrabass study* (2011), were performed next by graduate student Riccardo Emilien and undergraduate Samuel Phillips respectively. The works explore extended performance technique in conjunction with the voice. Performers were tasked with virtuosic instrumental performance

and uttering various vocalizations. The studies played on the idea of stream of consciousness.

The finale was Jon Appleton's Solitude (2011) for piano and fixed media, which was dedicated to the memory of Max Mathews. Appleton prefaced the performance with an acknowledgement of Mathews and his important accomplishments and computer music. contributions to The performance, barely a week after Mathews' passing, beautifully expressed the heartfelt closeness that Appleton had to Mathews, who he described as a friend and mentor of forty vears. The piece began with the sound of a bell in the fixed media part ushering in a harmonic space undulating with the distant sound of pure, angelic sung voices. The bell again punctuated the entrance of the piano, performed by Appleton, which wove a beautiful harmonic tapestry. A low, regular, subdued gong propelled the piece to a new space. The piano re-emerged, rising from the shadowy space, and ascended gracefully as if reflecting in thought. From the musical shadows, Appleton recited a poem of solitude atop haunting voices. The piano returned with a beautiful cascade of children's sung voices ending the piece.

Publications

Source: Music of the Avante Garde, 1966-1973.

Edited by Larry Austin and Douglas Kahn

University of California Press, 2011, 396 pages, preface, introduction, eleven chapters, appendix, credits

\$34.95 paper (ISBN 9780520267459) \$70.00 cloth (ISBN 9780520257481)

Review by Michael Matthews University of Manitoba matthew@cc.umanitoba.ca



Figure 1. Cover of Source" Music of the Avant-Garde, 1966-1973

Source: Music of the Avant-garde was surely one of the most remarkable music publications of the last century. Between 1966^{23} and 1973eleven issues of Source were published in the magazine's hometown of Davis, California; its creation and development were closely linked to activities at the University of California Davis, which during those years emerged as a focal point of avant-garde music, with such resident artists as Karlheinz Stockhausen, David Tudor and John Cage. With this new publication the University of California Press has assembled scores, articles, photographs, and circuit diagrams from the original Source into a beautifully produced publication. Source2²⁴ contains a preface and an introduction, followed by one chapter devoted to each of the eleven published issues; an appendix and list of credits round out the 396-page book.

Reflecting on the goals of *Source2*, editor Douglas Kahn states that the current publication is intended to "provide substance where it might, and, in other instances, serve as a pointer to individuals, groups, events, trends, issues, and historical contexts found in the original pages of *Source* itself and elsewhere—and that scores be sought out and performed, histories be thoroughly investigated, and issues be developed and provoked." (Austin and Kahn, 2011) For this reader those goals have been admirably achieved.

In addition to founding editor Larry Austin (composer, trumpet player, professor at UC Davis and the driving force behind the creation and direction of *Source*), the original editorial board consisted of graduate composition students Stanley Lunetta and Dary John Mizelle, bass clarinetist Wayne Johnson, music lecturer and saxophonist Art Woodbury, and Paul Robert, a friend of the Austin family. With the exception of Paul Robert, the members of the original editorial board had been experimenting with group improvisation since 1963, and after Austin's return from a 1964-65 sabbatical year in Rome, the idea for *Source* developed in the UC Davis graduate composition seminar.

With the generous help of local printer Doug Galbreath, private donations (including contributions from the editors themselves), funds from subscribers, occasional trades with publishers and advertisers, and some support from Columbia Records, the editors were able to publish *Source*, with tremendous effort, dedication and clearly as a labor of love, for seven years, leaving behind at the close a remarkable legacy of eleven publications, as well as the materials for a planned Issue 12, which never saw the light of day.

Apart from its unique content, Source was also noted for its non-standard 11x14 inch page size and its unusual inserts, which included phonograph records, fur, plastic, magnetic tape and machine-gunned music paper (!). Taking these factors into account, it is clear that the publication of a facsimile edition of the original Source would have been an extremely expensive undertaking. Instead, the editors and the University of California Press chose to present a representative sampling taken from the eleven published issues. Douglas Kahn states in his preface: "Much as we would have desired to, it would have been impossible to reproduce the full contents of Source, let alone the original format and radical design and production, without creating a prohibitively expensive book. It made no sense to replace one collector's item with another." (Austin and Kahn, 2011)

This decision resulted in a publication that reprints more of the essays from the original *Source* than the scores. While it is sometimes

²³ Issue 1 actually appear in January of 1967.

²⁴ Since both the original publication and this new one have the same name, I will henceforth refer to the new publication as *Source2* to distinguish it from the original *Source*.

difficult to definitively establish what counts as a "score" in the context of *Source*, a statistical survey of the complete contents of the original publication (as listed in the appendix of *Source2*) shows that approximately 75% of the omitted items are scores.

As with any publication of selected material from an earlier work, one might quibble about why this or that item was omitted or included. In the case of Source2 this reviewer found no reason to do so. It is fair to argue that the omission of such a high percentage of the original scores presents the reader with a somewhat unbalanced perspective on the nature and spirit of the original magazine. Still, given the constraints of not being able to include everything, the editors have done an exceptional job of presenting an overview of Source; the goals, the diversity, the flavor, the excitement, the daring, the often pure and simple audacity of the original Source are all beautifully conveyed in this new publication.

The main strength of *Source2* lies in its assemblage of so much historical material in a single volume. It was particularly striking to this reviewer to reread (or read for the first time) the crucial contributions by, among others, Larry Austin, Earle Brown, John Cage, Morton Feldman, Dick Higgins, Tom Johnson, Harry Partch, Steve Reich, David Rosenboom, Fredric Rzewski, and Karlheinz Stockhausen.

One of the highlights of Issue 1 (1967) is Earle Brown's essay *Form in New Music*, a thoughtful and stimulating discussion, and one of the earliest major contributions to this important and difficult topic. The score to *And on the Seventh Day Petals Fell in Petaluma*, one of Harry Partch's best works, also appears in this issue.

Will Johnson's review of the *First Festival of Live-Electronic Music 1967* (Issue 3 - 1968) documents an important early event in the history of live electronic music — a series of concerts that took place in December 1967 at Mills College, Oakland, and UC Davis. This is an excellent festival review, complete with photographs, score excerpts, and a copy of the festival poster.²⁵

Issue 6 (1969), the only 'themed' issue, contains a large and excellent *Events/Comments* section, in which numerous composers address the question "Is new music being used for political or social ends?" Appearing as it did during a time of such political upheaval in the world, this issue provides a broad overview of the diversity of composers' attitudes toward the relationship between art and politics. Issue 6 also contains an excerpt from Jani Christou's beautiful semi-graphic score *Enantiodromia*. This issue appeared only six months before Christou's tragic death in an automobile accident, and it provides a sad reminder of the loss of this outstanding composer.

Larry Austin's own *Editorial* (Issue 8 – 1970), a reprint of articles that originally appeared in the *New York Times* in 1968 and 1969, depicts well the tension between composers and society that many on both sides of the fence perceived during those years:

"Music is dead. Long live music. Performance institutions like the orchestra, the opera, the chamber music societies and the soloists have kept us avant-garde composers of out for so long that we have learned to live without them. We have found viable means to present our music in much livelier and more inventive contexts. New technology and a changing society have helped us." (Austin and Kahn, 2011)

Much of the content of *Source* reflects this tension and sense of separation felt my many composers during the 1960's. Indeed, as Austin himself states in his editorial preface to Issue 1, "Rejection and dissent pervade these works." (Austin and Kahn, 2011)

²⁵ The festival poster was clearly influenced by the work of Alton Kelley, Stanley "Mouse" Miller and Rick Griffin, all of whom created the now classic rock posters of the 1960's. In the poster the festival's title is misspelled as *Live-Electronic Music*.

Annea Lockwood's confrontational mixture of music and fire, Piano Burning, appeared in Issue 9 (1971). While now probably violating local health and safety regulations, I remember the joy of participating in a performance of this piece under Larry Austin's direction in the early 1980's. Nelson Howe's Fur Music, which famously included one of the most noteworthy Score inserts, individual pieces of fur, reflects the composer's interest in blending the aural with the tactile: "The piece is designed to focus attention on the exploration of the tactile qualities of fur, but with the added requirement that the tactile sensations be heard. Thus, the performer is the audience." (Austin and Kahn, 2011) Mention must also me made of Nicolas Slonimsky's contribution Möbius Strip-Tease, which is suffused with his wonderful humor and is a jov to read.

Issue 10 (1971) was rich in content, presenting to North American readers what was probably their first exposure to Cornelius Cardew; it contains excerpts from *The Great Learning* as well as the draft constitution of the Scratch Orchestra. In addition, Steve Reich's famous essay *Music as a Gradual Process* was published in this issue, along with Pauline Oliveros' important work *Sonic Meditations* and one of the rarely printed scores of Anthony Braxton, *8KN-(J-6)*.

Apart from the selections mentioned above, I was particularly struck by the contemporaneity of the ideas found in articles such as Partch's *Lecture* (Issue 1 - 1967):

"I have noticed that most interviewers for radio, TV, magazines, and newspapers are far less interested in hearing my music or seeing a show of mine, than they are in hearing me explain in words why I ever created this music." (Austin and Kahn, 2011)

and Feldman's excellent *Conversations Without Stravinsky* (Issue 2 – 1967):

"The truth is, we can do very well without art; what we can't live without is the *myth* about art. The myth-maker is successful because he knows that in art, as in life, we need the illusion of significance. He flatters this need. He give us an art that ties up with philosophical systems, and art with a multiplicity of references, of symbols, and art that simplifies the subtleties of art, that *relieves* us of art. Whether it does this by the power of persuasion or the persuasion of power, I leave to the social pathologists." (Austin and Kahn, 2011)

Dick Higgins' essay *Boredom and Danger* (Issue 5 - 1969) is an important early discussion of some of the ideas of the *Fluxus* movement and in particular their applications to music:²⁶

"... it has become almost a hallmark or our mentality to accept the possibility of boredom and danger; a work which is without these possibilities only decorates life and so is merely a commodity; the most intense art is necessarily involved with these things, boredom and danger, not as a new mode, but because they are implicit in the new mentality of our time." (Austin and Kahn, 2011)

Other historically significant inclusion are the scores to Robert Ashley's and Alvin Lucier's groundbreaking works "*The Wolfman*" (Issue 4 – 1968) and "*I am sitting in a room*" (Issue 7 – 1970), as well as the original version of Cage's 4'33'' (Issue 2), which is accompanied by a series of letters revealing how the piece came to appear in *Source* and how the version later published by Peters differs from this first version.

Kahn mentions in his preface the recent release on Pogus Records of a compact disc set containing the original audio material from the six phonograph record inserts in *Source* magazine.²⁷ There may well be economic or

²⁶ Higgins was one of the earliest members of *Fluxus*, and is generally credited with coining the term "Intermedia" in his 1966 article of that name (*Something Else Newsletter*. Vol.1, No.1)

²⁷ CD One - Source Records 1 and 2

Robert Ashley, *The Wolfman*; David Behrman, *Wave Train*; Larry Austin, *Accidents*; Allan Bryant, *Pitch Out*

CD Two - Source Records 3 and 4

contractual reason why *Source2* and the new compact disc set were not released as a package, but it is both unfortunate and somewhat illogical that they were not. At the least the important connection between these two publications should be made more explicit in *Source2*.

An extremely useful alphabetical listing of the complete contents of the original *Source* magazine contents is included as an appendix in *Source2*. The inclusion of the original tables of contents for each issue would have been helpful, as would details of the original publication dates of each issue. Considering the importance of graphics throughout the history of *Source*, one wishes that facsimiles of the original covers had been included. Of interest as well would have been a listing of the projected contents of the planned, but never published, Issue 12.

In the early 1970's I was a composition student living in Los Angeles. At that time our music library had a subscription to Source, and I remember the sense of wonder that the discovery of this publication awakened in me. With its unique format, distinctive inserts, and, above all, its remarkable content, Source was like nothing I had ever seen before. In a pre-internet world, when so few examples of what was "actually going on out there" were available, the magazine was a revelation. Larry Austin sums it up well when he reflects on the original publication: "Looking back from the perspective of more than forty years, I think Source was an excellent impetus and learning experience, a perfectly legitimate way to learn our craft. We needed models. We needed to know what the *latest* thing was in order to either reject it or to incorporate it into our own work." (Austin and Kahn, 2011) The content of Source was often provocative and aggressive, as was much of the art of this period. At the same time it was, broad and daring, and reading it was a heady

Alvin Lucier, *I am sitting in a room*; Arthur Woodbury, *Velox*; Mark Riener, *Phlegethon*; Larry Austin, *Caritas*; Stanley Lunetta, *moosack machine CD Three - Source Records 5 and 6* Lowell Cross, *Video II (B)/(C)/(L)*; Arrigo Lora-Totino, *english phonemes*; Alvin Curran, *Magic Carpet*; Annea Lockwood, *Tiger Balm* experience of being a part of something vital and real.

The University of California Press done an excellent job with Source2, and the book will bring a smile to the face of anyone who loves the boldness that composers were capable of in the 1960's and 70's. In addition to the pure joy of reading it, Source2 is a significant contribution to the historical record, making available as it does a wealth of material to those who do not have access to the original issues (now selling at between \$500 and \$1,500 each). The book will be a success if it makes its readers want, as it did me, to track down (again or for the first time) the music and the composers, to read or re-read the essays, and to immerse themselves in the ideas and excitement of a seminal period in music history.

Reference

Austin, L. and Kahn D. ed. 2011. *Source: Music* of the Avante Garde, 1966-1973. p. 396. University of California Press.

Recordings

Elemental

By Robert Scott Thompson

Audio CD, Aucourante Records 1003, 2010.

Review by Steven Propp Steven Propp@calpers.ca.gov

One never knows quite what to expect when listening to one of Thompson's albums of Besides the Electro-Acoustic compositions. genre, he composes contemporary classical instrumentalists-including music for soloists-of various types and groupings, and he is also well known in the field of "Ambient" compositions (and I have it on good authority that he has occasionally dabbled in *rock* music). This album includes four works, about which Thompson states, "The four form a kind of set of compositions inspired by attributes of the astrological elements - air, water, earth, and fire." However, with the exception of Waters of Cabeus, this "elemental" identity is not

explicitly manifested; there are no crackling fires, nor rushing wind sounds.

In these compositions Thompson's musical palette is economical, subtle, and reserved. It is almost like a Zen watercolor painting in its deliberately understated manner—often utilizing slight variations in volume (e.g., from 'very soft,' to 'very, *very* soft') to make his statement. One detects such subtleties only upon repeated listening to the compositions. Although each of the four pieces has its own unique compositional character, the overall "feel" of the four pieces (all composed within a two-year period) is reasonably consistent, so that a listener can hear all four pieces in succession without interrupting the general mood created by the music.



Figure 1. Cover art of *Elemental*

Out of the Vivid Air (2009): This piece starts sparingly, with clock chimes or bell-like sounds and occasional low rumbles (derived from percussion) reverberating, and these elements sometimes echoing. There are "metallic" sounds, which may seemingly migrate into "chirping" or buzzing noises—almost like electronic bugs or frogs—which transition into brief periods of near-silence (remember that Thompson studied with Cage). These in turn are interspersed with occasional "surprises," and subtle variations in volume. The piece becomes "busier" toward the end, with very rapid "metallic" sounds repeated.

Waters of Cabeus (2009): Thompson states, "All of the sounds are transformations of field

recordings of water." This second piece is a soundscape of long, sustained aural bodies which echo and diminish, seemingly drifting in and out, alternating with the more "active" sounds of bubbling water, with ominous low rumblings.

Shinrion-yoku (2010): This work is named after a Japanese term meaning "forest breathing," wherein the spiritual benefits of walking in nature are extolled. But far from being a New Age-v "sounds of nature" recording, this extended piece eschews the softer ambiance of the earlier pieces in favor of a gently discordant, occasionally almost "grating" (though never aurally unpleasant) metallic sound. There are low, gonglike tones, mixed resembling with sounds electronicallydeconstructed human voices. The latter sounds emphasizing long, ambient, sustained effects, building up in volume, and then declining into brief periods of silence, which may be ended by another dissonance.

Embers (2010): Perhaps the most "mysterious" track on the album (as well as the longest), it is the one that perhaps most frequently and effectively uses silence as an integral part of the composition. It is possible to be nearly unaware of when the piece actually ends (until one's stereo skips to the next CD, of The composition includes sounds course!). resembling ceramic chimes, but Thompson states, "Most of the sounds heard are originally from the piano but are significantly transformed and elaborated." The piece ends-as does all human endeavor-in silence.

I would recommend Thompson's recent album, "Vivid Air"—which skillfully blends instrumentalists into the mix of electronics—or "Ghost Words," for listeners desiring to hear more of Thompson's recent Electro-Acoustic works. His varied compositions are available from several labels, most notably Aucourant Records (BMI).

Tips and Tricks

Intro to JUCE: First Serving

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What is JUCE?

Developing audio applications can be a nontrivial task for experienced developers and weekend coders alike. Many issues, including having appropriate libraries. threading capabilities, simple user-interface implementation, and audio I/O complexities are made "easy" when using JUCE. JUCE is a C++ class library for building cross-platform audio applications and plugins. Having been extensively developed and extended by Jules Storer since 2003, it is now widely used for audio software development. Developers from both non-commercial and commercial communities (e.g. Tracktion, PPMulator, Codex Digital, Ueberschall, ICT7, and many more) utilize JUCE to render their cross-platform software products. JUCE is supported on a variety of operating systems including Windows (Windows XP, Vista, 7, and 8), Mac OS X (10.5 and later), iOS (versions 3 and later), Linux kernel series (2.6 and later), and Android hardware using NDK-v5 and later. It works with the following compilers: GCC versions 4.0+, LLVM - LLVM Clang, Microsoft Visual Studio - Visual C++ 2005+, and MinGW.

Getting Started: The Introjucer

In this iteration of the Tips and Tricks section, we will introduce a simple step-by-step tutorial on how to develop audio applications In this tutorial, we are using Windows-Visual Studio, and we have verified that this same procedure works equally well with Mac-Xcode. We start with the "hello world" of computer music, namely, a simple sine-signal generator audio application built solely in JUCE. Before we begin, please download the JUCE library for your operating system (Mac, Windows, or Linux) either from the JUCE website²⁸ or from github²⁹. Once downloaded, you will note that the installation zip file includes three directories: (a) modules for various functions with which JUCE projects are assembled, (b) "extras" for auxiliary functions such as windows dll or Introjucer, and (c) and example directory that that includes a number examples for various audio applications including code for the traditional "HelloWorld" demo. In the same zip file, the reader will also find two additional files: an executable "introjucer" (a) file (if downloaded for OSX, the extension is .app) and a README.txt file. (b) Running the introjucer.app (for OSX) application one can immediately start a JUCE project as shown in Figure 1. Although it is possible to begin a project from scratch, we strongly recommend that the reader begin getting familiar with the various components and flow of JUCE by using the JUCE introjucer.

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Figure 1. JUCE Introjucer

Clicking on "Create New Project" will present a handful of options for your project as shown in Figure 2. We will start by selecting "Audio Application" followed by creating a name for our first JUCE project and finally selecting a directory where our project is to be saved as shown in Figure 3. As mentioned above, JUCE comes with modules for various

²⁸ http://www.juce.com/

²⁹ https://github.com/julianstorer/JUCE/

functions with which JUCE projects are assembled; we can later change the module folder location for our project. However, for now, please set the directory to the modules folder included in the default JUCE directory structure. Once the new project name, project directory, and module directory are set, press the "Create" button. Once a projected is created, project settings can be changed in the next page as shown in Figure 4. We can also select various modules that can be included in our project to provide more functionality. The final step in setting a project includes pressing the "Save Project and Open in Xcode/Visual Studio/etc." button. This final step concludes the setup a JUCE project session and a new project is created and shown in your chosen IDE environment.



Figure 2. Create New Project



Figure 3. Project Directory Setup

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Figure 4. Project Setting

Under the new project folder, we should be able to see three four directories: "External Dependencies", "JUCE Library Code", "JUCE Modules", and most importantly your project directory. In the "Source" directory under the project directory, two source code files can be found: Main.cpp and MainComponent.cpp. These files are populated with boilerplate code that is thoroughly commented and selfexplanatory.

We are now ready to compile our project, which can be simply done via the compile button of the IDE of our choice. If we see a black window as shown in Figure 5, our project has been successfully compiled.



Figure 5. Compiled Project

Now that we have successfully compiled our project, we can now proceed to add our own custom code to generate a sinusoidal signal.

Creating a Sinewave Generator

In this section we will provide step-by-step instructions on how to create a simple sinusoidal signal a set frequency and amplitude value. We begin by opening the MainComponent.cpp MainContentComponent.cpp file. In this file there are a number of methods we will need to edit: the constructor, prepareToPlay, and the getNextAudioBlock methods. Before we add our own code to the various methods, we will first add a private double-type variable sampleRate to MainContentComponent class as shown below in Code Example 1:

private:

```
double sampleRate;
float phase;
float frequency;
float amplitude;
```

Code Example 1. Declaring a variable for sample rate

We then initialize the sampleRate variable in the class constructor as shown in Code Example 2:

```
MainContentComponent():
sampleRate(0.0), phase(0.0f)
{
    frequency = 2000.0f;
    amplitude = 0.2f;
    setSize(800,600);
    setAudioChannels(2,2);
}
```

Code Example 2. Initializing sampleRate

The reader will note two default setters inside the constructor: setSize and setAudioChannels. The setSize function takes width and height as input arguments to set the application's window size in pixels each application can have a GUI window. As expected the setAudioChannels method configures the number of audio I/O channels in the format of setAudioChannels(int numInputChannels, int numOutputChannels). In our example, we have two input and two output channels.

Whenever an audio device is started or its setting changed, the prepareToPlay method is called in order to update the new audio sampling rate. As such, we need to set the sample rate value in prepareToPlay function as shown in Code Example 3:

```
void prepareToPlay(int
samplesPerBlockExpected, double
newSampleRate) override
{
  sampleRate = newSampleRate;
}
```

Code Example 3. Set sampleRate in prepareToPlay

The main audio signal processing is handled in the getNextAudioBlock method where the current audio block is written to and sent out to the audio CODEC. The code that creates a sinusoid and writes it to the buffer is shown in Code Example 4:

```
void getNextAudioBlock (const
AudioSourceChannelInfo& bufferToFill)
override
  float phaseDelta = 2.0f * float Pi *
  frequency/sampleRate;
  const float originalPhase = phase;
  bufferToFill.clearActiveBufferRegion(
);
  for (int chan = 0; chan <
bufferToFill.buffer->getNumChannels();
++chan)
  {
    phase = originalPhase;
    float* const channelData =
    bufferToFill.buffer->
    getWritePointer(chan,
    bufferToFill.startSample);
    for (int i = 0; I <
    bufferToFill.numSamples; ++i)
      channelData[i] =
      amplitude*std::sin(phase);
      phase =
      std::fmod(phase+phaseDelta,float
      Pi*2.0f);
    }
  }
```

Code Example 4. Modifying getNextAudioBlock

A number of getters and variables are passed through the getNextAudioBlock method which passes the AudioSourceChannelInfo struct type referenced via bufferToFill as summarized in Table 1.

Conclusion

In our first serving of JUCE, we have presented a step-by-step introduction on how to set up a cross-platform sine-wave generator application using JUCE. One can develop an application that runs on standard platforms saving precious development time that can be tedious, difficult, and oftentimes uninteresting. Since JUCE provides a high degree of stability and expandability, we can build on this basic sinewave generator application by adding a variety of functionalities as necessary. In addition, one take advantage of the thorough can documentation provided on the JUCE website as well a variety of examples found in the AudioAppExample directory, created during JUCE installation. JUCE is on many levels one of easiest options for developing cross-platform audio applications through a number of flexible tools provided by its developer Jules Storer. In our next JUCE series "Intro to JUCE: Second Squeezing," we will present step-by-step instructions and code examples to plot signals created through DSP processes in JUCE.

Method	Description		
bufferToFill.clearActiveBufferRegion	Convenient method to clear the buffer if the source		
	is not producing any data.		
bufferToFill.buffer->getNumChannels	Getter method for number of output channels.		
bufferToFill.startSample	Variable to write our audio samples to.		
bufferToFill.numSamples	how many samples we need to fill: buffer size		

 Table 1. Summary of methods in getNextAudioBlock

Experience the Difference!

We're not just *another printer*. We specialize in producing books and CDs for associations and organizations. What does that mean for you?

It means that your various time sensitive publications either in book or electronic form can be produced quicker and at less cost than a general printer. Why? Because we're specialists.

Every day, we are completing the puzzle and producing:

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House

From the start of your project, we partner with you, combining our technical skills and resources with your project and ideas to achieve the best result.

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- Provide you with ideas and expertise
- Help complete your publication efficiently and cost-effectively
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- Guarantee your deadlines are met
- · No wasted time spent or unwanted surprises

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Sincerely, and with best wishes,

Gene Whitford, President

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