A Tuner of His World: An Interview with Paul Lansky

Alistair Riddell

Few composers in recent years have explored the boundaries of computer music as imaginatively as Paul Lansky. Recognizing that Lansky's creative stature is as palpable in the exquisiteness of his music as it is in the detail of his curriculum vitæ, I decided to think of this interview as a collection of *corridor chats* (non-linear, of course!). Over time, I was hoping to gain insight into his current creative concerns the way I had through incidental daily contact as a graduate student at Princeton in the early 1990s.

Although this interview was conducted by email, the text, I hope, has an imprint of candid spontaneity and informality to the extent possible through this type of exchange and under the imperative of general publication. The fact that we are seasoned emailers—communicating this way for more than a decade now—would, at least, ensure that the interview mechanics were natural and relaxed.

Certainly, this text is considered. Its measure is different from that of a conversation transcribed from a recording because it evolved over a much longer period. A slow dialogue in electronic letters. I like to imagine he composed his responses on the same computer he composes his music (I know I did). Entirely probable, and an observation I'm sure would appeal to his sense of technological engagement.

To view Lansky as a computer hacker or boffin is to see him with only one of his hats on (others he wears are Professor of music at Princeton University, composer, guitar freak and folk music lover). Certainly his computer is a complex audio tool and he has toiled in its evolving creative domain now for more than two decades on both software and sound. Yet his enthusiasm for the computer is always mediated by a richly humanistic perceptiveness, tuned to a world most of us recognize with little difficulty. Like Walt Whitman or Henry Thoreau, Lansky's creative palette is the world he inhabits and his creative offerings reveal this world as far richer, far more complex, than we might have first thought. While listening to his music, we sometimes recall that the computer is operative in the scheme of sounds. We then marvel at how technology has contributed to our experience and how Lansky has used it. More often than not, however, the technological processes are transparent against the musical narrative. Interestingly, he compensates for this lack of overt technological statement by making much of the software he uses freely available on the Internet, effectively saying, 'Well, here's how I compose my music. Try it for yourself.' Many of us found this an irresistible and deeply engaging challenge.

To think of Lansky's music as 'computer music,' after one has heard it, is difficult. Under this rubric what we probably wish to recognize is the potential of digital technology in the hands of someone with considerable skill and creativity. The label certainly fails to invoke the sheer magic of his ideas unfolding in sound but it does say something about the openness of the future of this musical genre. Certainly, a glance over his œuvre on CD is enough to indicate a breadth of musical direction that seems to be ever-expanding and defiant of simple descriptions.

In one direction, his music is a synthesis of traditional musical gestures and real-world sounds. *Night Traffic*, based on Doppler-shifting traffic sounds tuned in diatonic harmony, is a good example. In another direction, many of his works employ text in ways that are not merely

innovative but ground breaking. Frequently, the text is given deeper resonance through readings by his wife and creative partner, Hannah MacKay Lansky. The intimacy this invokes within a work is breathtaking, reminiscent of a private reading between two people or a soliloquy of complex hue, as in *Things She Carried*. Traditional music often struggles to achieve this state of emotional directness, perhaps because from conception it is imbued with the imperative of performance. When music is manifest solely in the recorded domain, the composer can frame the experience as a communion between him- or herself and an imaginary immediate listener. I think this arises certainly because the listening experience tends to be private but also because the composition process is reflexive; the composer creates the sound, then listens, rejecting or accepting the result. In due course, the work freezes, possibly definitively, the result of a particular mode or context of working; a creative undertaking not easily duplicated or reentered at a later time. The idea of a music not performed but composed into existence, is a difficult concept to grasp for those who have never thought of music as something not performed. Even in our culture of listening to music on CD we find it hard to disassociate music from human activity in the physical world.

The experience of reading a book is, I think, an analogy useful in appreciating Lansky's music. Perhaps this is a consequence of technology that we can step away from something to look at it afresh. Indeed, another direction of his music also confirms that he is finding new ways to define his music in this way. For instance, Lansky has taken an interest in presenting familiar musical genres replete with a mixture of real and synthetic instruments such as the guitar interpreted through the 'plucked string' algorithm. With these sounds he carefully constructs the genre until the composition possesses a compelling *raison d'être*, not easily ignored, but not authentic. Here he is working through his passion for certain musical styles in a meta-compositional manner that positions him at once as both *aficionado* and practitioner. In particular, Lansky has expressed his appreciation of certain Folk and Rock music and more recently certain piano music styles in this way. A truly innovative stance.

In all, we find evidence of a musical sensibility not constrained by academic or high art contexts but one which reaches out to an increasing complex musical world. In doing so, Lansky articulates the importance of intimate musical expression and the role technology plays in achieving this, not only for himself but for many composers today.

The following interview took place between mid May and early October 1998.

Alistair   You have been involved with music technology and computers for many years now, what has been the most significant moment for you as a composer?

Paul   That's a hard question to answer. I've always regarded the computer as nothing more than yet another instrument. On all the instruments I've studied (guitar, french horn, piano), there was always a point where a productive feedback loop began, that is, I played something that sounded so good that all I wanted to do was play it over again. In the early days of computer music, making any noise at all was such a huge task that it was a wonder that anyone ever wanted to pursue it, but nevertheless, I did start to notice a feedback loop around 1976 or so and this kept me at it. I didn't really feel that I was getting anywhere, however, until I finished the Campion fantasies in 1978.[1] I do remember leaning back after I had finished that and feeling that I had done something good. It was not only the first computer piece I had written that I felt good about (it was my third computer piece), but it was also the first piece of any kind that I had written that I felt totally satisfied with. From then on I felt as if I had a good kind of feedback loop going, and it is what has kept me at it.

Alistair   Let's talk about the Campion fantasies a bit more. I have an idea that there is a 'feedback loop' of aesthetic intent here that should be examined.

One of the most striking aspects of your work for me in general, and perhaps beginning with the Campion Fantasies, is a musical expression that holds in balance the subjects of humanity and technology. I'm always struck by how your work with technology results in music that articulates contemporary human experiences and not simply contemporary electronic sounds. Was that something you were aware of at the time of producing the Fantasies? Was that part of the good feeling you had about the work?

Paul   I think that my first big realization about computer music, in the early '70s, was how pale it seemed in comparison with natural and instrumental sounds. I also never really liked electronic music, and have never even worked in any kind of analog studio. This may have had something to do with coming from a background as a performer. I couldn't get excited about Stockhausen, Berio, or Subotnick's electronic efforts, and I thought that the early Moog and Buchla synthesizers were basically cute toys. There were, however, three things that kept me interested in computers: analog-digital converters, which allowed one to sample and process real sounds; the workshop idea, that I was able to really get my hands on sounds; and the precise control computers offered. Another aspect of the situation is that I never really had a good opportunity to cut my teeth on writing for instruments, and found the whole experience more frustrating than anything else.

The rich complexity of natural and instrumental sounds, however, really fascinated me, and still does. Also, the idea that I could peer into domains which were not normally the stuff of music as we know it, such as casual speech, and world-sounds, was very exciting. I don't think that had ever been possible, and certainly not with the same degree of precision.

A big issue, however, has to do with enlivening recorded sound so that it can survive. What is the listening experience all about when it just involves canned sound and loudspeakers? How does one deal with this, and how does one compose for this?

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[1] *Six Fantasies on a Poem by Thomas Campion*. See Discography for details of recording of this and all other works mentioned in the interview.

Alistair   There are many points here to pick up on. But on your last point, for whom do you
think it is a 'big issue' to enliven recorded sound? I'm not sure what that means. It
strikes me that recorded sound is now the *de facto* experience. Let's assume that we
are not talking about private listening, which is like reading a book, because
enlivenment is, in this case, an internal matter. Enlivenment in the external case is
more complex. Every DJ who spins vinyl around the planet doesn't have a problem
with enlivened sound. Some of those venues are so alive it's almost fatal. But if you
look at the art music concert scene it does appear a bit flat except, perhaps, for
efforts with sound diffusion systems that attempt to convince the audience that the
sound they are experiencing is a unique and complex phenomenon.
What is enlivened sound? How is it achieved? Through people or technology?

Paul   What I am talking about is making recorded music lively on repeated hearings.
With performed music, the music lives on because different people perform it and
the results are always different. I guess this is what interpretation means. With
music which lives 'only' in recording I am concerned that you can listen to the
recordings many times, and each time there will be something fresh there. I noticed
early in my work with computer music that my results aged very quickly. What
sounded good on first hearing, sounded less and less good with successive hearings.
This is probably what prompted me to turn to so-called realworld sounds because
the complexity and depth of the sounds had more to do with our traditional
experiences in listening to recordings. But, more than that I found myself, beginning
in the early '80s, looking for ways to build in a kind of complexity and richness
which *repositioned the performance in the ear of the listener*, rather than in the hands of
the performer. In other words, the listener had to work just to process the sounds.
This really opened up with *Idle Chatter*. There is a lot of what some might call
stochastic noise in the piece. A great deal of randomness is used to create a complex
texture and it takes some work on the listener's part to decode that. I think that I
succeeded there since I can still listen to the piece almost fifteen years later and still
enjoy it, and I've probably listened to it more than anyone else.
So, I've come to think that the key to writing music which lives in recording is to
radically reconstruct the compositional process. I think a lot of electronic pieces fail
because they are using the model of traditional performance, and ultimately they
end up sounding like bad performances because they don't have any of the
unpredictability and randomness of real performances. Other pieces, like *Smalltalk*
and a number of pieces I've done recently, are really very complicated. It is as if
there are very familiar things lurking behind a dense curtain which the listener has
to carefully open. One recent piece is called *For the Moment*, which is actually a
listening suggestion. The listener has to concentrate on small details or the piece
will fail to make any sense.
Another aspect of this has to do with my use of familiar materials, such as tonality,
speech and realworld sounds, in unfamiliar ways. I think of myself as keeping
some things simple so that other things can get complicated.
I really, really want people to listen to my pieces more than once, and I want them
to sound even better on repeated hearings. So much of our listening to contemporary
music consists of one-shot deals. OK, now I've heard 'that,' no need to listen again...
This is certainly not the way we treat our favorite recordings. In the old days of LP
one of my favorite sights was a record jacket that was falling apart from repeated
and frequent access.

Alistair   Your discussion on 'enlivening' recorded music seems to me a new dimension of contemporary composition but quite specific in its context, i.e. with recorded music. It is radical in its tangential relation to historical compositional practice. It seems born, first, out of an awareness of the place of music in the late twentieth century, and second, out of the cognitive nature of recorded music experiences.

Do you sense a uniqueness as well as a future in this mode of compositional thinking? Do you view the 'enlivenment' of music, as you have described it, as a highly personal approach to composition or something that can be formally evaluated and thus critically considered? In other words, do you see it as a compositional issue beyond your own concerns?

Paul   I'm pleased that you sense the importance of these arguments. It's really just dawned on me in recent years, and I don't think there has been much discussion about it. I think it is critically important and that many composers have been thinking about it in one way or another, although I think that the failure of a lot of contemporary music lies in its refusal or inability to consider things in the following terms:

To my mind a piece of music negotiates its terms in several senses. First it negotiates its space. A Brahms symphony, a Webern song, a film score, tape music, pop music, dance music, techno, recorded music of one sort or another, all describe a particular world-space, for want of a better term. You notice it when conditions are contradictory, like playing a Webern song in a dance club. Furthermore, a piece also consequently negotiates terms with its listeners. Sit still and listen carefully, or dance to me, or talk over me, take me seriously, or just use me as the color of your world. In a very real sense you can see that the way a piece of music goes, specifically, its tunes, words, rhythms, contours etc., are, in one way or another, the specification of its space, and its negotiating terms with its listener. Some pieces are rude, some polite, some are appropriate, some inappropriate, and all these attributes may be reasonable and appropriate, or unreasonable and inappropriate. The space and terms I like to think of with my pieces are basically in the intimate settings of someone's home where one can take them in with the same kind of attention and devotion one would use for a good book. I don't think my music works that well as background music, there is too much detail, and I don't think it works that well as concert music. And just as you can, and often do, reread a good book, I am concerned that a piece invite imaginative reconstruction on repeated hearing. So, the compositional methods I use are specifically aimed at achieving these goals. When I write pieces for instruments the means and results are quite different. (One of the most interesting things about music for me is the way you can listen to a piece hundreds of times without feeling that you have nothing new to hear and learn.) I think that the failure of some music lies in its inability not only to create a lively space, but also to enter into a discussion with the listener. I think it is relatively easy to tell when this happens. Just think of your average boring, dreary contemporary music concert. It often seems as if the pieces are acting like priests who have gone through a ritual once too often and are just mouthing the words. In other words, the terms of the discussion and its context are frozen. To continue the parallels: music which lives only in recording cannot depend on the fact and familiarity of recorded music to justify its existence, or it would come to sound like no more than a recording of the same bored priests.

My answer to your question, therefore, is that I do not see enlivenment as a personal compositional approach but rather as something that good composers have always

programmed in one way or another. On the other hand the proliferating variety of media and spaces for music today present a lot of challenges to composition in which it is absolutely critical that these issues have a direct and palpable effect on compositional methods: the way pieces go. In as much as this view of music differs substantially from what might be called a positivist view, in which a piece has objectively defined qualities which exist in an abstract sense as well, it leads to an evaluative stance in which observations must take into account the way a piece of music threads its way through the world, the ways that it describes a listening space, as well as a way of listening. I can easily imagine a very profound analysis of a piece which focused only on these things.

Alistair   Your comments suggest that we now must consider the contemporary listening experience from perspectives that only a decade or so ago would have been hard to appreciate even among people who thought themselves musically aware. However, today, all musicians, and of course listeners, almost intuitively comprehend the complexity, diversity and challenge of our global musical world and wrestle with the difficulties of positioning themselves in it.
So can we talk a little more about the terms of negotiation for a musical space. If we view the concert hall, the dance floor or the home living room as known listening spaces, part of the creative process of enlivenment must involve stating the terms under which the listener is to accept new or composer-determined spaces. The listener has to agree to these terms otherwise the experience fails. Yet it is not quite that simple because, if I understand you correctly, the terms are not entirely musical or even overt, and ideally require re-negotiation on each listening. How do you see the dynamics of this space? Do you feel that noise plays an important role in asserting the space into which musical ideas are to be placed?
What I'm curious about is the nature of the world-space, can it be composed as a conscious act perhaps independent of the music and might such an ambition become a kind of 'music' itself, where composers search for the resonance of the space and perhaps care less about the content?

Paul   This is a very difficult question for me to answer, and perhaps I can best approach it by being evasive. It's obvious that music has many more functions than ever before. We use it in films, television, cars, as environmental color, as objects for study and scrutiny, as icons for social identification, status, protest, etc. Of course it's always been true that music has played many roles, but I don't think the variety has ever been as great as it is now. The concept of musical space, and the negotiations involved in creating and identifying it are therefore as multifarious as the functions music fulfills. What a rapper or an opera-goer does to feel comfortable and process the music smoothly will have a lot to do with their respective roles in life and their needs and expectations. It's obvious that most rappers would feel peculiar at the opera and most opera-goers would not know what what to do at a rap concert. (You and I are probably rare in that we could function equally well in both spaces.) But one could imagine what each of these listeners would have to go through in order to be able to accept the opposite music as fact, and not as an absurd affront to their sensibilities. (I suspect that you and I can process these well because we are able to deal with music in more abstract ways.) Their negotiations would have a lot to do with their respective images of their places in society, and by extension, their respective musics can be seen as part of their self-images and identification. Peculiarly enough, one place where both might feel comfortable is in film, where

the music plays a role which is similar, but where the viewer is able to be detached. I'm sure a lot of opera-goers would have no difficulty with the rap in the movie *Bulworth,* and a young audience nursed on rap would probably know what to do with *Farinelli.*

I haven't really answered your question, but I hope I've recast it in an interesting way. I just can't imagine how one could generalize in these terms. Perhaps one aspect of the failure of experimental music is in the extent to which it requires an audience capable of abstraction and able to view music without regard to its larger role. Or perhaps the failure has something to do with the lack of a larger role.

Alistair   In response to your last comments, I'd like to move towards the particular, that is your music, at least the works from the late 1980s onwards, and discuss how they challenge musical spaces, often the most unlike musical spaces for a person in your position.

For instance, while you can produce a work like *Not So Heavy Metal,* as a composer don't you pursue the Metal scene as a career, ideology or culture? Yet, from one important perspective, the electric guitar, you felt compelled to address the genre in your own way. So one might view the work as something of a homage, perhaps, to the cultural impact of the instrument and your private relationship to it.

Again, in *Night Traffic,* there is an almost Hitchcockian take on road traffic. Like *Not So Heavy Metal, Night Traffic* critiques a musical/sonic space from a position at once subtle and intensely private. These works are like witness statements which expose a perspective we were unaware existed but which ultimately casts the whole musical space in a new light.

I'm reminded of Charles Ives' music here with the difference that one has to transcend his musical/world position to feel that one is able to appreciate the subject of his work. In your works mentioned above, one immediately understands the context and subsequently ponders the musical interpretation.

If you agree with my observations, do you think that it is, in part, a way in which you have made music function for you? Rather than being solely about the presentation of composed sounds in a contemporary manner, your music may be read as a commentary on your immediate world, where you are saying, 'this is how I see it,' and the seeing is in the listener's visualizing of the sounds.

Paul   At the risk of peering inwardly a little too deeply, let me ruminate a bit on coming of age in the '60s and '70s and see how it led to the situation you characterize.

My original compositional training was in a hothouse atmosphere where virtue and value was measured in invention and abstraction. A good composer was someone who took you to utterly new places which were described in totally new and original terms. I don't want to dwell too much on this positivist environment, except to say that I was completely swept up in it, and anybody who wants to see a testimony to persistence can consult my dissertation, 'Affine Music,'[2] which is a derivation of a system of multidimensional cyclic arrays using linear algebra. I still think this is very interesting stuff, and that there is a lot of musical potential there. It's related to George Perle's *Twelve-Tone Tonality,*[3] and I worked closely with George for several years on developing this. He's still using it and writing great music. But,

[2] 'Affine Music,' PhD diss., Princeton U, 1973.
[3] *Twelve-Tone Tonality* (Berkeley: U of California P, 1977).

fortunately, I discovered that there was a mismatch between my musical personality and this way of thinking. I'm just not cut out for this way of operating.

My fundamental and original relation to music is that of an omnivore. If it's music, I love it. I have a much harder time thinking of music I don't like than music I like. And, almost Zelig-like, I want to own and become the music I love.

This realization and a real breakthrough came in the early '80s with *Guy's Harp* which is a portrait of a blues harmonica player. With this piece I really felt as if I was able to occupy a new seat at the table and engage in compositional activity that was closer to the relation I had with music in general. (I flip every time I hear good blues harmonica playing, for example, and even fantasize about learning to play–I tried–and playing in blues bands and clubs on weekends.) But since I also want to do a million other kinds of music-making, the limitations of a life-span intrude. So, I happily discovered that the computer is a way to glom[4] my musical loves onto my compositional life. A motivation for the *Idle Chatter* pieces, for example (*Idle Chatter, just_more_idle_chatter*, and *Notjustmoreidlechatter*) comes from a fascination with rap, and with backup girl-singers in bands. *Not So Heavy Metal* is like *Guy's Harp* but in relation to rock.

These things led to a relation between me and the computer and composing in which I think I'm essentially strumming world sounds, and perhaps even strumming other people's music. In a sense, the atomic units of my pieces are not 'pitch-classes' and 'temporal divisions' but rather sonic *objects*, musical and otherwise. The rather traditional and often tonal characteristics of many of my pieces are probably motivated by similar concerns: to own a lot of the music of the past that I love.

I'm pleased that you perceive a particular world-view in pieces like *Night Traffic*, because it leads me to hope that I'm succeeding in doing what a composer should do, create an individual view of the world. I think that *Night Traffic* borrows a lot from opera and film, and even Strauss. (My colleague Ken Levy described is as *'Tod and Verklaerung* on Wheels.') I think that the expression of this world-view is particularly enabled, and perhaps even created by technology. The terms of the discussion are new and you can consequently say new things.

Another way of looking at this stance is that it depends heavily on external reference, while the positivist background I describe emphasized internal reference. It's hard for me to really construct an objective position about my own music. I can think of a lot of pieces which don't fit the above description so neatly but in general there is usually some sort of view from this angle.

Alistair   What would you have done without the computer? The composer you are now seems radically different from the composer associated with George Perle and the theories of twelve tones in the 1970s. It would appear that the computer is somehow responsible for a significant shift in your ideas on music and sound. Would you have been that interested in electronic music without the computer's presence?

In your notes to the *Smalltalk* CD, you make the point that you changed direction in computer music from the search for 'new sounds' and 'unknown soundworlds' to one of 'human sounds and the noise of the world around us.' This seems to me one of the important distinctions between computer and electronic music, although one easily blurred; what are your thoughts on it now?

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[4] 'glom:'American slang for take, steal, appropriate.

Paul It is certainly clear to me that had I not met the computer, I would now be somewhere else entirely. I think, however, that the computer melded well with my basic personality and that I probably would have sought it out had it not presented itself so conveniently at Princeton. When I was young I always enjoyed building things with my hands, doing pottery, and in general being occupied by tasks which had some physical component to them. My favorite toys were the kits with blocks to build houses etc. (I would have loved Lego), and a fascinating toy called an Erector Set. The computer satisfied these needs in several senses. First, I took very easily to programming. It seemed a lot like building kits. You construct components which then interact. Second, the whole working process satisfied my workshop mentality. Again, you're putting lots of bits and pieces together to make a finished product (which you really don't do when writing for instruments). Finally, I've learned over the years that I have a very particular social failing: I 'hate' asking anyone to do anything. I love it when players perform my instrumental music, but asking them to do it is very difficult for me. The whole world that one has to engage to be a successful instrumental composer is one that I find very awkward, embarrassing and repugnant.

In retrospect, my turn to 'realworld sounds' was part of a process I described earlier: to deepen the listening experience of music on tape. I think that more and more composers are moving in this direction these days. I've just finished judging two competitions, and listened to about a hundred electroacoustic pieces. I can't remember any that didn't use recorded sounds in one way or another. (The era of those ghastly DX7-type pieces we had in the late '80s.is over, thank god.) I suppose that composers are beginning to realize that the computer is not very good (yet) when acting as an ersatz instrument, but is superb at processing sounds. Perhaps it's also true that our tendency to listen through the memories of physical processes argues in favor of this approach. On the other hand, it's becoming a lot easier to develop interactive computer instruments these days, where physical activity has a direct and obvious sonic consequence. It's anyone's guess where this will lead.

Alistair We've somehow managed to avoid talking about technology. Can you describe the technology you use, how you work with it and why you like to work that way? I realize that today, what technology a composer uses can be a private thing and often difficult to explain to other composers, but I still feel that it is at the heart of the kind of sound the composer produces.

Paul Right now, my studio consists simply of an SGI Indy workstation, with a MIDI keyboard attached, and good DACs in a DAT player, which is connected to the SGI through digital i/o. That's it! (If I were a young composer at this point I'd probably buy a Mac G3 and use programs like ProTools, Max, Supercollider, etc.) I got here, as I described earlier, by deciding that the best way to work would be to maximize the number of experts available to help me, and since I was working pretty much alone, and the only real expertise available was in the engineering school where people knew Unix and digital signal processing, my best bet was to be in a position to be able to take advantage of that, which meant learning to program, and working in a flexible environment. I really think that one learns more by trying to do something, and asking questions when you reach a brick wall, than by taking a course. I have done an extraordinary amount of low-level programming, which was necessary only because there was no other way to get anything done. Once I even wrote a short program in HP binary—not assembler, but rather the code that

assembler produces—since I needed to do something on a machine (an HP 2116) that we were running without an operating system!

I also spent a semester writing an i/o driver in PDP assembler for a set of custom DACs on a PDP11/34 in RSX11. Since nobody was around to help me with RSX11 I wrote the whole thing in kernel mode (below the operating system), which meant that I had to write my own terminal, keyboard, and tape drivers as well. I'm very proud of it, but it's a testament to stubborn persistence. (I learned PDP11 assembler sitting on the beach in Manly, Australia, in 1982, in fact, when I was visiting the Sydney Conservatorium.)

I subsequently wrote or adapted four Unix i/o drivers, and was the first one to write a Unix driver for a fancy DMA card that DEC produced. Engineers at DEC started referring people to me, which was embarrassing since my coding was so sloppy. You've been in the same position and have also done low-level work, actually even lower since you've worked at the chip level! If I seem to be bragging, I am. I guess I'm proud to have been able to do things which allowed me to make music, and which are considered daunting tasks. I really don't think that I have any unusual intelligence, just a lot of stubborn patience. (In the early days on the IBM mainframe, my account subid was 'patience' and my password was 'tryagain.') The nice thing about computers is that there is (usually) a right and a wrong answer to any programming question. If you get the wrong answer, you just wander around until you find the right one, and you usually do. In fact, I don't think I've ever made an intelligent mistake. Errors are usually just the result of your own stupidity.

At any rate, to cut to the chase, I'm now only dependent on a C compiler to get anything done, and I can do pretty much anything I can figure out how to program. I'm still using the same basic software that I was using fifteen years ago, Cmix, and a variety of other homebrew programs. I don't think I use much commercial software, although I think it has reached a much more powerful and mature level than it was at, even five years ago. Still, whenever I look at someone else's software, even powerful programs like MAX, I have the feeling that someone is trying to tell me how music is supposed to go. I'm sure that Cmix has a similar bias, even though I try to deny it, but at least it tells me how 'I' think music should go.

Over the years I've resisted special purpose hardware. I predicted, and I seem to be proven right recently, that processors would get fast enough to do everything in software. Also, you don't want to be put into reset-mode in a learning loop every two years when your hardware becomes obsolete. Everything should be done in software. And the software should be portable. I'm still using some software that was written in 1969, in fact, although I had to translate it from Fortran to C.

One basic question which arises in all this concerns the interface. You wrote your dissertation on this, so you know a lot more about it than most people do.[5] I don't think I want to extemporize on it here to any extent, but I do want to say that I think that there are some serious conceptual limitations imposed by highly graphical interfaces. To me they often seem to have a real effect on the inner workings of your imagination. They seem to be telling you how to think, in addition to what to think. Working at a more abstract level, may sometimes be harder, but your brain engages the task with a much more complicated kind of mechanism. More work is being done by your imagination and less by the interface. You think harder, in other words.

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[5] See Alistair Riddell, 'Composing the Interface,' PhD diss., La Trobe U, 1993.

This view has led me to develop software which relies much more on a text-based level of communication than on a graphical one.

This is not just because it is easier, which it is (I just learned how to use a backing-store, the hard way), but because again, it is less biased. In short I feel that the more work your brain does and the less work the computer does, the more you are put in a position where imagination is the most powerful tool at your disposal. It is certainly true that images can portray things in ways that words cannot, but I worry about their power, precisely in this respect, particularly when it comes to manipulating sound.

The real advances come, to my mind, with simple advances in computing power. The fact that Cmix can do things in real time, and that my mixer, RT, can mix and process about twenty 44k stereo files in real time, has had a profound effect on my music and my working methods. When I listen to my older pieces, I can really hear myself struggling with the machinery, trying very hard to turn great big wheels and knobs. More recent pieces, however, sound much more fluent and pliable, to me at least, and I think this has a lot to do with the power of today's hardware.

Alistair   It is evident in your music that technology facilitates composition across musical times and styles. To some extent, technology apparently functions as a means for you to think through what music will be manifest as part of your creative efforts. This has come about through your work over two decades bringing computer technology to the powerful creative state that you now access. In other words, this is a significant intellectual investment that you combine with your knowledge of music every time you compose. This is, of course, an experience shared by many composers using technology and strikes me as historically unique to musical practice at the end of the twentieth century.

In the future of music technology as you understand it, as you have invested in it, what is important to you and why? Do you ever contemplate a future compositional context that isn't based on advances in computing and audio technology? Do you feel that the technical evolution in any form will impact on your creative aspirations?

Paul   If I understand your question correctly, you are asking me about the use of specific kinds and types of music in my computer music, that is, other music, such as blues, jazz, folk music etc. I think that this is new only with respect to the modernist tendencies of the '60s and '70s which encouraged a more abstract approach and dismissed notions of style and genre as relics of music appreciation. On the other hand, in the eighteenth century it was not at all unusual for composers to think in these terms. Bach and Mozart definitely thought of themselves as composing in an 'Italian' or 'French' style on occasions, and Brahms certainly composed with folk music. When I first started to work with folk music on the computer, in the early '80s, I did approach it with a certain amount of mischief in mind. It seemed to be a violation of the new music context, and my feeling at the time was that, in addition, this was the only way I could, in fact, play with folk music. If I were to write it for instruments, none of the new music groups who normally played my music would touch it with a ten-foot pole. I also was interested in seeing if I could simply get the computer to do a reasonable job with it. This was, and still is, a very difficult task. But, there is a more interesting and perhaps deeper consideration lurking: that the roles of producer and composer are merging, and that the computer would become the center of recording technology. I felt at the time that this would happen, and I am gratified to see that it has. In a way then, I am positioning myself, metaphorically,

in a recording studio when I sit in front of the computer, and rather than thinking of the computer as an experimental sound-generating machine, I think of it as an all-around sound-handler. In this respect it is not surprising that my most heavily used piece of software is RT, a real-time mixer. The illusion of the recording studio still exists in the industry today, but a lot of CDs these days are created in people's home studios and living rooms. I like this a lot, and it resonates well with much of the work I've done over the past twenty years. A long time ago I said that I liked to view the computer as an 'aural camera' on the sounds of the world. Doing a piece like *Guy's Harp* allowed me to detach myself from usual compositional responsibilities, and become something more like a documentary film maker. I found it quite refreshing to shed some traditional responsibilities and take on some new ones. There is a lot of chatter in popular music these days about the power and creativity of the producer, in addition to the composer and performer, and a sophisticated command of a computer puts one in a position to move seamlessly between these roles, merging, overlapping, combining them.

I think that it is inevitable that technological evolution will affect my compositional aspirations. On the other hand, I like to point out the relatively slow rate at which art evolves, particularly as compared to the extremely rapid evolution of technology. Art that responds quickly to technology is always going to be immature, in my opinion. There is an awful amount of junk in recent years which passes as art but is nothing more than a weak demonstration of someone's new hardware or software. Technological brilliance, which we are seeing in abundance these days, is a different kind of thing than artistic or intellectual brilliance, and I don't think that there are necessarily clear lanes of interaction between the two, although they undoubtedly are mutually influential to some extent. In fact I think there there is often a confusion of the two, and they frequently masquerade as one another. It is certainly possible to harness brilliant technology in the service of art, but for the art to be successful, in my view, the technology has to be invisible.

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Discography

Solo Albums

For the Moment, Chords, Now That You Mention It, Same Scene Nine Years Later, Andalusia and *Shadows. Conversation Pieces,* with Paul Lansky, keyboards & computer, Bridge Records, CD9083, 1998.

Things She Carried, Bridge Records, CD 9076, 1997.

Strut, Tender Ladies, Delia, Ash Grove, Hammer, Barbara Allen, Howl, Pine Ridge, Wayfaring Stranger, Pretty Polly, Blue Wine and *Motherless Child. Folk Images,* Bridge Records, CD 9060, 1995.

Idle Chatter, Word Color, just_more_idle_chatter, The Lesson, Notjustmoreidlechatter and *Memory Pages. More Than Idle Chatter,* Bridge Records, CD 9050, 1994.

Six Fantasies on a Poem by Thomas Campion, Still Time. Fantasies and Tableaux, CRI, CD 683, 1994.

Table's Clear, Night Traffic, Now and Then, Quakerbridge and *The Sound of Two Hands. Homebrew,* Bridge Records, CD 9035, 1992.

Smalltalk, Guy's Harp, Late August and (with Steve Mackey) *Not So Heavy Metal. Smalltalk,* New Albion Records, NA030CD, 1990.

In Collections

Crooked Courante [gtr]. On *Newdance,* with David Starobin, Bridge Records, 9084.

With Steve Mackey, *Dancetracks* [gtr & computer]. On *Lost and Found,* Bridge Records, 9065.

Hop [marimba & vn]. On *Combo Platter,* Marimolin BMG/Catalyst, 62667-2.

Stroll [chamb ens & computer]. On *Composer in the Computer Age* vol.3, Centaur, CRC 2213.

As If [str trio and computer]. On *Virtuoso in the Computer Age* vol.1, Centaur, CRC 2110.

With Brad Garton and Andy Milburn, *Wasting.* On *Inner Voices,* Centaur, CRC 2076.

As It Grew Dark. On *Computer Music Currents* vol.11, Wergo, 2031-2.