ICMC 2008 Keynote Address

by Trevor Wishart
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First of all, I'd like to say how honoured I feel to be asked to give this keynote address to the ICMC in Belfast, especially looking at and listening to much of the innovative work on display here. At 62 I'm beginning to feel like one of those aging rock stars, with the droopy eyes, advancing weight problem and receding hairline, rolled out on TV chat shows to talk about the good old days. But we all get old eventually, so I hope you'll bear with me.

I want to begin by saying that I intend to be controversial, because I want some of the issues I'll raise to be discussed and argued about. I may exaggerate a little for the sake of encouraging debate! I'm going to talk about my experience over 40 years of working with music technology, and I want to focus on 5 important questions. These are:

1) The Access question: who can use this new technology?
2) The Repertoire question (a question for performers or promoters): how easily and how widely can this music be performed?
3) The Visibility question: who listens to this music?
4) The Stability question: are these technologies sufficiently stable to be widely adopted and explored in depth by the musical community?
5) The Aesthetic question (probably the most contentious): how can we evaluate the work we're producing?

To start at the beginning of my own journey into this new world, we have to return to the 1960s. At that time computers were almost mythical entities, vast purring beasts kept in sealed, air-conditioned rooms at a constant temperature and exclusively attached to University Science Departments or huge business enterprises. They were attended by their grateful 'minions', who had to type computer code onto punched cards or paper tape and feed these into reading devices that would not have looked out of place in a mass-production factory.

Live-performance devices for electronic music consisted of things like analogue filters, distortion boxes for electric guitars, or delay-lines based on looping-tapes. Some were packaged in a black box "effects unit" to do a pre-ordained task like flanging or phasing. The format of these devices was determined by the demands of the commercial music industry. Widely available electronic synthesis was primitive,

but was adopted into commercial keyboard 'synths' as an extension of the traditional organ.

Electro-acoustic music had to be made on analogue tape-recorders, which ran at 2 or 3 speeds, and possibly had vari-speed control. Sound could be fed from several of these to a mixing desk, where some kind of EQ control and panning was possible. The major tool was the razor blade, with which you would cut the tape in a splicing block, and the fight against analogue noise (or signal distortion) when making or mixing recordings was perpetual. So the available apparatus for sound-manipulation was minimal, and you had to rely very much on your own ingenuity and lots of time-consuming and tedious work, as well as on your sonic imagination.

What made it worth grappling with these uninviting tools were the new aesthetic possibilities they offered. In particular, for me, it was the ability to bring any sound, no matter how complex, from the real world into the musical domain and to have some means to musically manipulate it. However, the limitations of these tools quickly became frustrating. You can understand Boulez's impatience with sonic-art at the time, as one had almost no handles on the inner-workings of sounds. The commercial approach was to use signal processing as a way to massage or colour pre-existing musical structures.

This equipment was also relatively expensive, especially the mixing desk and associated plumbing. So production was confined to University studios or special National Centres (like EMS in Stockholm, Radio Warsaw, or the GRM). As a student or invited guest you might have access to a wonderful studio, but if you didn't end up as a university music lecturer or a rock star, a personal studio of any useful power was beyond your wildest dreams.

In the late 60s, *musique concrète* and experimentalism swam in a context of high modernism. Tones had to be atonal, rhythms arhythmic, counterpoint or texture dense and hyper-complex, and forms enigmatic or non-redundantly impenetrable (the theoretical notion of maximising "information" through non-repetition).

The audience was miniscule—a tiny element of the already tiny audience for contemporary music in general—and confined to specialist venues where the necessary hardware for performance could be assembled. However, there was a radio audience in North America, which had a culture of many small public-subscription radio stations, and crossovers with the more experimental end of popular music had begun to happen.

At the time, my focus was on innovation

and new possibilities, with little concern for issues of repertoire or the stability of the resources. I only became aware that there might be problems of that sort after working for some years on quadraphonic spatialisation of sound (which inspired the chapter on "Space" in *On Sonic Art*). Suddenly, manufacturers decided that the commercial market for 4-channel analogue tape machines was not viable, and they ceased to produce them. A few years later, I found myself in a small German city, scouring the local rock-studios for a now-redundant 4-channel tape-machine that was rumoured to still exist, in order to play one of my pieces in that evening's concert. For the first time, the problem of the long-term viability of this music hit home to me.

For the sonic arts community, more worrying was the long-term viability of the medium itself. Scored music could be easily copied (by hand if necessary), but tapes had a finite lifetime even in the most advanced storage facilities. In one's enthusiasm for the work, one tended to put these issues to the back of one's mind.

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The arrival of computers heralded a revolution in the way we could think about sound. As I've argued in *On Sonic Art*, traditional ways of thinking about musical structure—on a lattice of pitch-classes and duration values—tended to regard the other properties of sounds, lumped together in the catch-all category 'timbre', as a kind of colouring in of the structural framework already provided by pitch and duration.

The idea of rational signal processing—applying a rigorous analytical and synthetic approach to all aspects of sounds—means that traditional formal approaches to music-making can be extended to the sound as a whole. More radically, I've argued that the key conceptual shift is from thinking of music as the organisation of the *properties* of sounds to thinking of music as the organisation of sounds as unified objects that we can transform in a multi-dimensional space. With hindsight, Stockhausen's *Gesang der Jünglinge* can be seen as a prophetic piece in this regard, although it was still framed in the lattice-oriented conceptual framework of serialism.

The ability to analyse sound in detail and to understand and control its inner structure were the high-end pay-offs. More banal but equally important were the conquest of unwanted noise, and the replacement of cupboards full of tape-reels by physically invisible computer-files and the whole data-management environment that came along as a free perk with the computer. Most significantly, here was a way of precisely and permanently recording sonic

data in a format independent of particular physical-device specifications, and storing it permanently.

However, for technical reasons related to computer speed and job-sharing protocols, this kind of processor-intensive computer-music was initially confined to a handful of institutions around the world, of which IRCAM was the only one in Europe.

For me, the aesthetic pay-offs were immediate. In *Red Bird*, I'd been struggling with the idea of using sound-metamorphosis as an approach to organising musical materials. In the analogue studio, one could do this only in a limited way. However, with some background in maths and science it was clear to me that it should be possible to take sounds apart and reconstruct them using computers. I immediately submitted a project to IRCAM, which got me invited onto their induction course. Here I discovered that my intuition about sound-morphing on computers was in fact correct, and I was invited to make a piece. However, my entry into this world was delayed, as IRCAM then decided to change its computers and reconstruct its software base. I had to wait another 5 years before I could begin developing sound-morphing tools using the Phase Vocoder. This down time proved to be constructive for me, as I ended up writing *On Sonic Art*, the book about all the things I would have liked to be able to do, if only I had the tools to do them! And this inability to continue the work illustrated one major problem of such research-intensive, centralised institutions.

The high visibility of IRCAM on the European music scene certainly raised the profile of music-with-technology among the general classical-music public. But the centralisation of technical resources, if anything, made the access and visibility questions more acute. The research benefits of these large institutions could only be offered to a very few composers and for very short periods of time. This meant that the institutions could be resented, and the music they promoted dismissed as irrelevant, by the larger musical community that continued to pursue avenues not reliant on the technology in this magic castle in the sky. And the division of the musical world into the 'elect' and the rest meant that there were composers at IRCAM who not only had no idea what to do with the technology, but actually feared it. They were only there because their publishers felt that an IRCAM piece would look good on their résumé. Using the technology was to be a mark of status, not of commitment.

Moreover, the research emphasis created problems even for the composers lucky enough to have access to these resources. If they were able to make a return visit, they were more than likely to find that the technical environment of the institution

had significantly changed. So two-thirds of their time would be taken up in learning the new tools available, and too little was spent in composing the work.

The repertoire issue is best illustrated by the legendary problems of putting on Boulez's *Reponse* with the million-pound 4X machine. What venue could afford to import this machine and the technical back up crew required for the work to be performed?

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At the other end of the spectrum, live-electronic devices powered by computer chips in black-box signal-processing modules began to be developed for the commercial music market by major manufacturers like Yamaha and Roland. However, the computing power in these devices was pre-packaged and sealed in. The devices were generally inflexible, with settings only changeable through a complicated sequence of button-pushing operations, and the preset states available were completely controlled by what the manufacturer considered to be desirable or marketable. (The advent of the DX7, with its programmable FM-synthesis patches, did improve this situation to some extent.)

In between these extremes, imaginative, programmable devices like the 8-bit Fairlight machine or the Synklavier made some degree of detailed musical intervention possible. However, these were still in the University-studio or rock-star price-bracket, so they could never become the basis of a more widespread musical practice.

In general, composers wishing to work with affordable commercial devices and willing to work within their limitations could easily transport their music from venue to venue. However, the priorities of manufacturers and musicians were not the same. For manufacturers, the priority was to sell as many units as possible, so each year the black boxes appeared in new updated versions or were superseded. Works or musical practices dependent on the original devices quickly had to be reformulated or simply abandoned. The repertoire problem began to be significant. For composers, the problem was the stability of the composing environment. Why spend the time developing expertise in writing works using these pieces of equipment if there was no guarantee that they would be available a few years down the line?

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The second really important revolution in computer music had almost nothing to do with musicians or music-technologists. It was the arrival of the desktop computer, with its gradual increase in speed. During

the 5-year hiatus in which I'd waited for IRCAM to replace its computers and update its software base, I'd acquired a desktop computer (an Atari—Macs were not fast enough for professional audio-quality sound at the time). With a group of computer-music enthusiasts in York (in particular Martin Atkins, Andrew Bentley, Archer Endrich, David Malham and Richard Orton), we developed a small interfacing box and ported public-domain programs like Cmusic, and later the Phase Vocoder, onto these desktop machines. Most significantly, we began to establish a viable environment for building new software-instruments at home. As a result, I was able to continue developing new sound-morphing tools, like waveset-distortion[1], or iterative-extension[2], together with more and more sophisticated means to manage and organise musical data, and these all became part of the Composers' Desktop Project suite of tools, which graduated onto the PC.

Most importantly, we were now able to make music on an environment that was affordable, relatively permanent, and under one's own control.

Quite soon thereafter, IRCAM itself moved to a new regime based around desktop machines, allowing composers to take its innovative tools away from the main institution and work with them at home.

Today desktop computers and laptops are almost universal (at least in the developed world) and have much greater power and speed than even the biggest of the computing machines that were installed at IRCAM when I first went there. High quality digital recording is easy and cheap, and there's access to an inexhaustible stream of source-sounds via the media and the web. There's also powerful free software available on the Internet; at the click of a mouse, you can produce an endless stream of continually novel sound events. With hindsight, we can see that the Composers' Desktop Project cooperative was a key pioneer in this field, liberating public domain software in use in the big institutions and going on to develop

1. Waveset distortion is a whole class of signal-processing algorithms that do many things, from semi-unpredictable distortion of natural signals to 'organic' envelope generation. The musical example, from my piece *Imago*, demonstrates waveset duplication modifying stable attack-resonance sounds derived from the clinking of whisky glasses. These sources are themselves taken from Jonty Harrison's *...et ainsi de suite...*

2. Iterative extension is a way to plausibly extend natural iteratives, like vocal grit or rolled 'r' sounds, that have similar, but non-identical, short, attacked components. In the example, from *Globalalia*, the first sound in each line is the recorded source, and the sounds that follow are plausible time-extensions and extended musical developments of these. The sources are recordings of Japanese TV actors playing samurai warriors.

hundreds of new signal processing tools, making them available cheaply to a new constituency of non-institutional producers of Sonic Art.

Today production is completely decentralised. Anyone can make electro-acoustic music on a home desktop computer, or generate flexible live-electronic patches in MSP, Pd or Super Collider.

The positive impact on IRCAM and other institutions has been immense. Many more composers could pass through their gates, and those composers were better prepared and the quality and depth of the work they produced increased greatly. Furthermore, the wider musical community began to feel empowered. Sonic Arts were now a normal activity to which all musicians could realistically aspire.

This new ease of access to sound materials and tools has also ushered in the vast growth of Electronica and experimental DJing out of the world of popular music. Artists like Square Pusher, Aphex Twin and Richard Devine help blur the boundaries between art-music and popular entertainment, re-establishing a link lost towards the end of the 19th century. Before that time, the piano in the living room was a place where the "classics" could be played alongside the latest music hall songs (and there were still easy-to-play classics). The desktop computer as a sound recorder and manipulator has re-established the link between popular and art-music applications of this technology, as well as amateur involvement in 'sonic play'.

There are also many new fields of artistic activity using sound. We could mention Soundscape Art, where the focus is on the authenticity of what is recorded; Installation Art, where sound can be an adjunct to a visual exhibit or an exhibit in itself, and where the listener experiences sound in his/her own time-sequence in a gallery space, rather than following a clear start-to-end time-line defined by a composer or performer; and Radio Art, where we may be especially concerned with how sound is transmitted and received. We're also seeing a new kind of "Algorithm Art", where an algorithm is set in motion, but because of uncertainty about the initial conditions, unpredictable inputs or system instability, the sound or graphic output cannot be predicted. So the resulting sound or visuals become a kind of evidence that the algorithm is doing its stuff. They are epiphenomena or by-products of the process rather than its goal. This is certainly an interesting area to explore, though for me it's not music, except by chance. Imagine a program that generated strings of integral signs, numbers, plusses and minuses, and so on. The output might be fascinating to look at, but it wouldn't be mathematics, except by chance.

Furthermore, because of the ease of assembling sound materials and the simplicity of processing, one can knock together a sound piece of some kind in a short time, and it's now commonplace to give the drummer a break and put together a quick electro-acoustic atmospheric track amongst an album of otherwise 3-minute songs. This is what I'd like to call 'Light Electro-Acoustic Music' without denigrating it in any way, the modern equivalent of those wind-band pieces written to be played in the park in Old Vienna when one wasn't writing the next Symphony.

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The problems of visibility and accessibility appear to have been solved. But these are ongoing problems as the technology develops. Speaking here close to the SARC centre with its impressive sound-diffusion hall, one's focus is obviously drawn to the current developments in sound-spatialisation technology. I recently attended an amazing event at TU Berlin, which featured the GRM's Acousmonium, the ZKM's Klangdom and the TU 2000+ loudspeaker Wave-Front Synthesis array in the same hall, and heard many spectacular works composed for (or projected on) these different sound-spatialisation systems. The musical and aesthetic possibilities they each offer are very exciting, but they reintroduce the problems of access, visibility and repertoire into the world of music-technology. Any hardware intensive system creates problems in transporting musical output to other (or rather, most) venues. For the composer, owning such a system in its current manifestation is inconceivable. Even if you are an invited guest at one of these institutions, the time available to work, and therefore develop skills, on such a system is inevitably limited. At the moment, for the average non-institutional composer, the idea of *scaling up* a finished work from stereo or five-point-one to multi-stereo or multi-channel by diffusion on an Acousmonium or SARC-type system is still a more practicable possibility than competing for limited access-time at a major institution to work on a highly sophisticated spatialisation system, and then having few opportunities to present the work in its finished form elsewhere.

It seems to me that a parallel revolution in the design of very cheap, high-quality loudspeakers is necessary if such systems are to really take off in the specialist musical community, let alone in the wider arena of music venues. We need to make this technology accessible. Speculating wildly, from a composer's point of view, my thoughts were drawn to those curious globe-shaped hair dryers one used to see in women's hairdressers, fitting right around the head. Might it be possible to

develop a structure like this, fitted with dozens of tiny high-quality loudspeakers which could all be physically repositioned, and software reconfigured, to generate a miniature SARC or ZKM around one's head? It would be something that would give a good (if low audio quality) approximation of the effects of a multi-loudspeaker environment in a hall, and allow one's ideas to be more quickly scaled-up and realised when faced with the real thing—the 'SARC space-helmet' perhaps! This may be completely crazy, and yet even this would not solve the problem of the portability of the finished work to venues beyond the major institutions. That really requires high-quality loudspeakers (and the accompanying cabling, or radio-transmission) to fall nearer to the price-bracket of decorative wall-tiles.

Different cautionary remarks could be made about some of the exciting new commercial devices that have become available, like the Wii controller. Are we sure these devices will still be around in 10 years time?

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And has the stability question been solved? Although in principle digital media offer a more controllable and a more stable environment for sound arts, the problems have not entirely disappeared. In some senses, the priorities of technological research and the artistic requirements are at odds. The continued improvements in sound storage media have seen me transfer works from analogue tape to the PCM digital-on-videotape system to digital audiotape and most recently onto audio and data CDs, DVD-RAM and Flash Memory. Recent rumours have suggested that CDs may now be on their way out. So I guess in the end digital media will rely, like everything else, on institutional archivists willing to devote their time to preserving (and inevitably selecting for preservation) digital materials, as the technology marches forward.

In the home studio, the stability of one's working environment can be continually threatened by software 'improvements' or operating-system upgrades, and, if you use commercial software, one puts out of one's mind thoughts of the long-term viability of the product or the commercial companies that supply it. In the very long-term, perhaps, only open-source code and open-source operating systems will provide a guarantee of stable composing environments.

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The repertoire issue continues to be problematic. In the classical musical world, successful works get performed by many different groups, and therefore develop a history of interpretation and reception by

audiences. They enter the repertoire. This relies upon the fact that most musicians use the same technology (the traditional acoustic instruments) and have all the skills necessary to use them. In this way the music matures and takes on a life of its own.

Working with computer technology with very large ensembles (like orchestras) requires an extra layer of experts alongside the technological hardware, and in most situations, this is currently neither affordable nor available on a concert-to-concert basis. As a result, most scored live-electronic pieces are written for small ensembles who have some commitment to these kind of works, and they're performed within institutions where either the composer or technical experts can offer the technical backup required. Taking these works 'on the road' can be problematic, as the composer cannot always be on hand and most venues cannot guarantee the sort of technical backup required. As recently as 2006, a well-known international ensemble that champions new music performed their no-technology version of Berio's *Aronné* at the University of York in the UK. York is an ideal place to get equipment and technical expertise, yet they chose not to ask for it. Their reason? Jettisoning the technology made touring much more practicable.

Packaging more complex set-ups in something as portable and generally available as a laptop would seem to offer a simple solution to the touring problem. But even the best patches can screw up, computers crash, and so on. This can be disillusioning, even for the committed non-specialist. Performers in the past who have worked consistently with music-technology, like Jos Zwaanenburg or Jonathan Impett, have tended to gather together a particular set of easy-to-operate and easily transportable black-boxes or patches that they can manipulate on stage without major technical help. The only performing group I ever worked with who had a technical person on board all the time was Electric Phoenix, and John Whiting was an audio-engineer rather than a computer-operator.

In this context, the possibilities for live-electronic works to pass into the repertoire are still not good. Writing uncrashable patches helps, plus using totally robust and easy-to-operate hardware that doesn't change radically every few years (if only it existed). The only real long-term solution would seem to be including a computer-music expert in the performing group, but unless the group is intending to perform computer-using works all the time, this is unlikely. What might solve the problem is the development of a viable profession of computer-musicians who could be hired for particular tours or concert seasons, so that performing works using technology

would not seem daunting to the average musically-adventurous chamber group.

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Finally, I've mentioned the many new developments in the audio arts, and welcomed what I would call the *normalisation* of the sonic arts in the wider community. The sophisticated large-scale structuring of sound I'm interested in takes its place in a continuum of possibilities from musical 'Kunst' through popular culture to pure amateur messing about with sound.

What's more problematical is the spread of a certain strain of post-modern social criticism that blames 'modernism' (and often, by implication, the Enlightenment) for the horrors of Auschwitz and the Gulag. Often starting out with the best of intentions, like criticising the dominance of European cultural values or, from a feminist perspective, the dominance of male-oriented cultural perspectives, it can sometimes end up making any kind of aesthetic (as opposed to sociological or political) valuation impossible. In this situation, the utilitarianism of 'The Market' takes over, where shopping becomes the ultimate expression of human freedom. How can there be any place for musicology or aesthetics if artistic value is merely market value? More importantly for me, how can we possibly justify spending large amounts of time crafting sound materials or developing new software instruments if all we really need to do is stick to available clichés and improve our marketing skills?

This is not just a theoretical issue. Departments of Music embracing Technology increasingly have to justify themselves in either 1) market-oriented terms: their turnout of record-producers, Foley sound experts for the film-industry and so on, making a visible contribution to the economy; or 2) technological terms: music (and particularly music using technology) has to be cast in a Science/Technology mould, with research projects having technological (and therefore marketable) outputs. At the very least, research projects must be portrayed as if they are tackling technological or practical problems, and hence potentially generating industrially useful output. In this atmosphere, musical outputs can tend to be downplayed, at least in the official reports. (I'm glad to say that the music at this conference demonstrates that we are successfully fighting off these pressures, so far.)

But if we were really to follow the market-oriented theory of value, we would be forced to some absurd conclusions. For example, in December 1997, "Teletubbies say Eh! Oh!" was top of the singles charts in the UK for some weeks. As most of you probably won't recall, the Teletubbies were one of an ongoing sequence of

puppets or mannequins invented for the televisual entertainment of very small children. "Eh!" and "Oh!" were a pretty good sample of their conversational sophistication. In the Christmas period of 1997, the BBC released a single 'sung by' these mannequins to capitalise on the Christmas consumer surge, and the music was pitched at the same level as the lyrics. As intended, many doting parents of tiny tots bought the record for their offspring. By the logic of exchange value, this was the most valuable music available in the UK over this period.

But the market ranking doesn't take any account of the sophistication of the audience (are they aged 2 or 42 for example); the influence of topical but transient events (the popularity of what's on the telly, the Christmas shopping spree); socio-economic trends (the pressures for both parents to go out to work due to the dictates of the consumer economy, almost obliged to keep their kids entertained in front of the TV); the originality, craft, or even the duration of the merchandise.

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So how, in this atmosphere, can we categorise 'Art-music' and at the same time escape the stigma of being 'elitist'?

I think we need to differentiate between *elitism* and *exclusivity*. For me, electro-acoustic and live-electronic music have already breached the exclusivity barrier. The tools for making them are reasonably accessible through powerful free or cheap software, ease of high quality digital recording or easy access to media or web sound streams—compare this to writing for an orchestra. The means of distribution are easily accessible through independent CD publishing and web distribution—compare this with the historical problems of getting musical scores type-set, printed and distributed, and obtaining the backing of a major publishing house to promote performances of the work. And the work is easily 'visible' to potential listeners through CDs, or the web, not confined to some specialist venue in a distant metropolis. Furthermore, in my own musical practice I run workshops for both professionals and non-specialists, school-children, the elderly and so on, helping to develop people's own creative abilities.

But accessibility must mean *elitism for all*, not just anything goes.

And if we're going to defend 'high' art values we have to ensure, at least in the medium term, that the technological facilities we are developing for such artistic endeavours are not the exclusive prerogative of insiders, people who work in the institutions or their Ph.D. students. We have to ensure that eventually some version of these resources enters the public

domain, as with IRCAM and the desktop revolution. At the very least we have to worry about what all those gifted research students are going to do once they leave. Institutional posts are a finite resource, and most of them will have no chance to acquire one. Hence my call for the development of cheap loudspeakers, and the means to interface these with a laptop, to match the exciting high-end research that's now going on.

The two elements of 'high art' I want to stand up for are, firstly, detailed craft coupled with the ability to build large-scale formal structures; and secondly, an engagement with ideas, and as a consequence, hopefully, the durability of the work. My skills or intellectual emphases may be different from others, so I'm not foregrounding my own particular skills or intellectual concerns in opposition to the skills and ideas of others. I want to stand up for all those who value craft and ideas in the Arts.

For example, soundscape art involves great skill in both selecting and recording its material. It also carries an implicit critique of some dominant ideas in our culture, particular the notion that we are masters of nature and have the right to exploit it and mould it in any way we want. I agree with this critique and its seriousness, even if my musical practice is very different. I don't think what I do contradicts a soundscape perspective, and I choose to express my environmental concerns by other means, e.g. by not owning a car.

In my own work, my concerns are more with the way industrial/consumer culture impinges on human values and how we might maintain a humanistic perspective despite the market—a concern for what we do and how we treat each other rather than what we own. My stress on the importance of craft and form-building, and making a durable product, springs from this idea. Also, coming from a family of manual workers, I admire the way carpenters, plumbers or plasterers work skilfully with physical materials, whereas hedge-fund managers are no more interesting to me than betting-shop owners. I'm also very aware of the tradition of free-thinking labourers in the area where I was brought up. And I started my University career as a scientist, so I'm very much in favour of the Enlightenment.

This often feels like swimming against the tide for various reasons. The market stresses built-in obsolescence, making things that look good but have a limited shelf life. Turnover is paramount, transience essential. The market also tends to privilege horizontal diversity over vertical complexity. It makes it easy to move one's focus sideways, from Polynesian folk-music to Burmese hip-hop—whatever takes your fancy in the everything-is-

available superstore of world culture, rather than pursuing some particular area in increasing depth.

Also, speaking as someone who still performs as a vocal free-improviser, I often come across the view that spontaneity or 'improvisation' *of any kind* is somehow morally superior to spending lots of time slaving over the details. It seems to encapsulate the notion that we're all free, unconstrained individuals, not hemmed in by any rules or obligations. This was perhaps best encapsulated in the punk-era philosophy that democratic access to music-making was more important than actual musical competence. But, in our society, the 'outlaw' is a standard folk anti-hero. There's nothing remotely anti-establishment about being anti-establishment; trashing the hotel room for the 100th time gets a bit predictable.

Good improvisation, from Bach to Coltrane to laptop orchestras, is founded on hard work and experience. Furthermore, good electro-acoustic or live-electronic composition can be viewed partly as a kind of slowed-down improvisational process, as new sounds and new software instruments throw up unexpected possibilities that we must *play around* with before we can find their most effective musical use.

From another perspective, easy access to an over-abundance of sound materials from the media and the web and free, powerful software tools can make the idea of slow, painstaking studio work even more unglamorous. This was brought home to me by a student I was mentoring who was amazed to find that I composed 'down at the millisecond level'. All the sounds in his work were selected from online sound-libraries and simply edited together in Pro-Tools. After enjoying my work in the concert he said—without irony—how great it would be to sample it.

I'm obviously not against sampling, as the piece *Two Women* demonstrates. And one of the highlights of the festival for me was Brian Cullen's *Thrice Removed*[3], with its sophisticated integration of video imagery and sound spatialisation tied to a strong idea. You didn't need to read the programme notes here to understand that this was an exploration of how 'reality' is construed or constructed through the media.

It also raised an interesting side-issue about the use of topical material in Art-works. What happens when the topical reference ceases to be topical? I've already had to face this question with *Two Women*: I've played it to school kids who don't

3. This piece uses excerpts from the long-running popular British TV soap *Coronation Street* as the starting point for exploring notions of reality in the media.

know who Princess Diana is, never mind recognise her voice. So you have to be sure that both the musical structure and the commentary being made will survive the demise of the specific subject matter you're using. I think the Cullen piece passes this test, and I'm hopeful that this will also be true of *Two Women*.

I also admire highly crafted and intensively-worked plunderphonic pieces. But there are no deterrents to being less painstaking. The ease of sampling other people's material has meant some professional entertainers—who I can't name in public—have been able to turn theft into an art form, leaving the hard bits to others. It's flattering to have one's work widely quoted, but the perpetrators are unlikely to give you any credit for your effort. And, in this context, it's only the formal coherence of a work that will set it apart from an elegant collage of chunks of it together with other people's materials, picked-and-mixed by one of these fly-by-night superstars.

Finally, at my age, I can even admit that *tradition* can be useful. At the very least it provides a handy checklist to test whether our 'spontaneity' is merely a cliché, our 'originality' just a self-delusion. It's also a treasure house of good ideas that can be re-interpreted or further developed rather than attempting to reinvent the wheel on every occasion. We don't need to pretend to be *entirely* original to be fully human. The unique individual is merely a marketing construct.

What interests me at the moment is how to build large-scale musical forms within the sonic medium. My last released work, the three-movement *Fabulous Paris*, was subtitled 'a virtual oratorio' to link it to the tradition of extended non-staged works for voices, but this is a purely secular oratorio. The piece takes as its starting point our experience of living in vast cities in a mass society. For example, the third movement uses layered recordings from the media (traffic-accident announcements on the California freeways; advertisements; game-show hosts; political commentary or demagoguery) to suggest the excitement and terror of the modern megacity. In contrast, the second movement examines the particular voice and private experiences of a single person—in fact my aunt, age 70, reminiscing about her childhood. The harmonic material there is all derived from the melody of her speech, in particular the phrase "and this is me, when I was six".

I'm currently working on a piece using voices recorded from a cross-section of the community in the North East of England, and I hope to produce a one-hour piece that keeps the listener engaged. This presents an interesting visibility problem. I've recorded the voices of adults, aged between 23 and 93, and of children as

young as 5, who may never have been to a concert music event before, even less a contemporary art-music event. But I expect most of them will want to hear what I've done with their voices. So the piece has to work in a local context where people will recognise both themselves and the spoken content, but also in a concert in, say, Berlin or Tokyo.

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So, to conclude, my aim in this talk has been to trigger some responses to these five fundamental questions about the sort of music we make—the questions of access, repertoire, visibility, stability, and aesthetics. I trust I've not offended too many people by the way I've presented these questions, and I hope that there might be some fruitful spin off from what I've said today.

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