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A New Universe of Piano Sound?

Abstract

This paper begins by describing this author's experiences with extended piano techniques and his work with electronics. It then goes on to describe the methodology for research which will lead to a new universe of piano sound.

Paper

The starting point for this research is simply musical curiosity. I believe that there is a hidden treasure of extended piano sound which is at this moment locked away, waiting to be discovered. I have had odd, tantalising glimpses from time to time of a world beyond, yet have had neither the means nor the motivation till now to discover it. This research is to try to find the key to this treasure and to freely distribute its content to whoever may be interested. Julian Johnson (2002:129)¹ has eloquently described the resulting possibility of life-enhancing developments:

Not only does music offer the possibility of transcending daily life; it offers, in as many forms as there are musics, a reshaping of these categories. It doesn't obliterate them in some narcotic emptiness, but reworks them and thus offers us new models of experience. And this has real power, because as we participate in this process of enactment, we experience new ways for ourselves. When we leave the musical work and return to daily life, we have tasted a different way of being, a different perception of the world. Potentially, this leaves us marked by the experience. It subsequently produces an altered perception of the world.

There are two strands in my musical background which I hope can be brought together as a result of this research: extended piano techniques and electronics. Boulez (cited in Emmerson 1986:6)² has succinctly summarised a fundamental paradox:

As though by a defensive reflex, the greater and more powerful our technological progress, the more timidly has our culture retracted to what it sees as the immutable and imperishable values of the past ... Among other consequences, an historicising culture has almost completely blocked the evolution of music instruments, which has come to a disastrous halt for both social and economic reasons.

¹ Johnson, J. (2002) *Who Needs Classical Music/Cultural Choice and Musical Value* Oxford: Oxford University Press.

² Emmerson, S. (ed.) (1986) *The Language of Electroacoustic Music* London: Macmillan.

Keyboard instruments, in their earlier manifestations, have been around for hundreds of years and their predecessor, the harp, for at least three thousand. The forte piano, invented by Cristofori around 1714 went through many developments to reach a state of stasis around 1860. With the exception of the third pedal (sostenuto), invented by the Chickering American firm of manufacturers around 1880, developments since 1860 have been in detail only³. Moreover, the rapid development of the piano until 1860 was composer led. The last sonatas of Beethoven seem to envisage an instrument well beyond that of his time. In the days of the wooden frame, Liszt would have three pianos on stage which, during the course of one of his concerts, would gradually be destroyed by his pianistic assault. The increasing demands of power and range had lead directly to the invention of the iron frame⁴.

Moreover, the stasis reached in piano design is also reflected in performance conventions. The pianist sits sideways to the audience (a convention originating from Liszt so that the ladies in the audience could admire his fine profile!); he or she makes their way to the platform, bows, performs, waits for applause (this normally happens, but there are times when it doesn't), bows again, leaves. There are extra points for playing from memory⁵.

By contrast, the electronic medium is very young, having only been viable since the late 1940s. The tools are led by technology, rather than the music. The technology seems to develop and to become obsolete at a bewildering rate. Jerry Hunt (cited in Austin 1991:109)⁶ has argued powerfully that the composer must go along with it:

Suddenly, you're just plain forced to make the change. The standards change around you. You don't have any choice. It isn't even a question of wanting to stay in an older technology. You've got to go forwards, because there isn't anything to support the older technology. All the support networks fall away from it⁷.

I first became fascinated by extended techniques on the piano when I gave the first British performance of *Makrokosmos II* by George Crumb at the South Bank Centre in London in 1977. I had long been aware of the age-old pianistic controversy about whether you could make timbral differences on the keyboard by finger shape. The ear says quite clearly that you can, but the visualisation of the overtones is inconclusive (addendum 1, ex. 1–2). At the moment,

³ Interesting mutations have included one in the Royal Academy of Music collection: a six pedal Clementi piano which included a Turkish drum from the early nineteenth century.

⁴ Stockhausen, in 1983 showed me an upright piano built to his own specifications with dampers which reach right up to the top note in order to be able to play *one* chord in his Piano Piece Number 1! A singular and extreme example of a modern development being music led.

⁵ When I performed *Piano Nets* by Denis Smalley at the Aarhus/CMC in 1994, the main talking point was that I played it from memory – there was no comment on the quality or otherwise of the performance. Even as recently as January 2006, the same comment was made about this performance 11 years before.

⁶ Austin, L. (1991) 'Live – electronic music on the third coast' *Contemporary Music Review* Vol. 6 Part I p.109.

⁷ As recently as March 2011, I gave a concert in Cambridge where the composer utilised an SPX1000. It was a strange experience!

then, this still remains unresolved. I realised quite soon with the Crumb that in order, for instance, to play successfully inside the piano, it was necessary to practise the piano as though it were a different instrument (in this case, a harp). One can quite easily play six sounds which are timbrally quite distinctive. One can therefore make interpretative choices. In the score, Crumb simply directs them to be played with the flesh of the finger or the fingernail (addendum 1, ex. 3–8). Eventually, in 2002 I recorded all the Crumb solo piano works. (There are some tantalising earlier examples of the use of overtones in Schönberg and Bartok, see addendum 1, ex 15, 16, 17, 19, and of course the ‘prepared piano’ of John Cage.) Examples 5 to 14 show some of the simple extended techniques used by Crumb and by other composers.

Other notable performances that I was involved in, which used some of these techniques was in 1983, when I gave the first British performance of the Stockhausen’s *Piano Piece XIII*, after having studied it with the Stockhausen family, and the London premiere of Henry Cowell’s *Piano Concerto* with the BBC Symphony Orchestra at the Barbican in 2003. This latter piece was a challenge. The score is little more than a sketch – all the notes are there, but few indications of how to play them. Furthermore, the whole pianistic discourse is in clusters. In order to create some variety in this rather prolix way of playing I investigated the different ways one could play a cluster and found, by weighting the arm differently for instance, that there is a whole world of different sounds that can be obtained.

This was all quite explainable. But I also had some tantalising moments of discovering sounds which I could not explain. In Chris Dench’s *Passing Bells: Night* there is one moment where a low C is played with a quiet A, a third below which creates extraordinary overtones. There is a very strange sound, with the final three-note chord of Horatio Vaggione’s recent piece *Gymel IV*, which creates an unusual sound. Why is this? It is not enough to simply recognise that this happens, I want to know why it happens, and at the moment there are no answers. As Luc Vaes has explained in his recent (2009) PhD thesis *Extended Piano Techniques* there has been a surprising little scholarly work written about extended techniques on the piano. His thesis magnificently sums up the history, its techniques and the present state of knowledge about the subject and would be the main springboard for my own investigations.

During the same period, I was heavily involved in commissioning pieces for solo piano and electronics. These nearly always used the piano conventionally. (An exception being Simon Emmerson’s *Piano Piece 4*, see addendum 1, ex. 23.) The relationship between electronics and piano, however, varies with each piece: in Javier Alvarez’s *Papalotl*, to create a “larger” piano; in Jonathan Harvey’s *Tombeau de Messiaen* (addendum 1, ex. 21), a play on two different tuning systems; and in Denis Smalley’s fine work *Piano Nets*, a subtle interplay of different relationships.

The most integrated relationship is that by Vaggione where there is a synergetic process where all elements are fused into one. An extraordinary sense of unity pervades his work:

I generally use sampled sounds of the instruments played live as material to be processed by digital means, including analysis resynthesis techniques. The main reason for this is that it allows the source instruments to shift to the electroacoustic world, that to extend their world and their virtual palette of possibilities, sometimes carrying them as far as to be cut off from their origins, whilst at other times managing to retain some of their original, energetic, gestural, or morphological features⁸.

With the exception of Vaggione, I began to realise that the most successful combination of piano and electronics was not using the piano conventionally, but by using extended techniques. Denis Smalley, who has only entered this domain once, commented to me that he found it very difficult to match the two timbres of electronic and conventional sounds, and was at great pains during rehearsals to direct balance, weightings, direction and so on. Indeed, the inherent danger could be that “sampled” conventional piano sounds add a certain sameness to the electronic material and restricts the timbral imagination.

So is it, therefore, possible to create a new pianistic language of “extended” sounds which ally themselves naturally with electronic sounds? I believe there is. For this research, I will deliberately restrict myself to the use of the finger only. Of course, there is a whole world of timbres to be obtained by means of “preparation” – with screws as in Cage, or other objects as in Crumb, but I prefer to be restrictive. This will enable me to thoroughly explore this one area which is less tangible and possibly more subtle and artistic.

The research questions to be addressed are as follows:

- 1) Why do extended sounds have a different quality to normal sounds? What is the nature of the difference? What are the acoustical properties of these sounds?
- 2) Can these sounds combine with electronic sounds in a meaningful way? Is there some as-yet unknown acoustical link between the two types of sounds, hitherto unexplained?
- 3) How far are these sounds on the piano the result of the characteristics and quirks of individual pianos, and how far generic?
- 4) Can these sounds be quantifiable into general principles?
- 5) Is it possible, having answered these questions, to create a new universe of piano sounds, and a new meaningful pianistic language which could be used by composers?
- 6) Can these findings be published in such a way as to be useful to composers writing new works?

⁸ Vaggione as cited in Budon, O. (2000) ‘Composing with object, networks and timescales: an interview with Horacio Vaggione’ *Computer Music Journal* 24: 3 pp. 15–16.

The research will involve four institutions and I conclude with a brief description of their various interactive roles (see addendum 2 – flow chart – time line).

First stage: University of Hertfordshire

A thorough investigation into the possibilities of “extended” techniques on the piano using the fingers only, with research into extant music, interviews with composers and executants and scholarly research.

Second stage: Centre de Recherches Informatiques et Création Musicale (CICM), Paris

An analysis of the data produced at the University of Hertfordshire and research into electronic sounds. This would mean digital analysis and processing of piano sounds, using techniques such as granular reconstruction, concatenative synthesis, expanded centroid spectral techniques and morphological oriented analysis – resynthesis (technical information kindly supplied by Horacio Vaggione). A second testing of data pianistically.

Third stage: De Montfort University

The data from CICM would be thoroughly explored acoustically to find links between the two sounds world. The data would begin to be put into publishable form. A third testing of data pianistically.

Fourth stage: Groupe de Recherches Musicales Institut National de l’Audiovisuel (Ina-GRM)

Organisation of seminars and workshops with selected composers, online publishing of analysis on the Acousmographe of works for piano and electronics, ready to publish worldwide.

I began with a quote from Julian Johnson, so I will finish in the same way (2002: 128)⁹.

Music-as-art shapes our perception of the world, not by pretending to speak of the real world, but by its construction of imaginary others. It sheds light on our present reality precisely by being conspicuously different from it. This music resists the everyday because its function is to be Other. ... Art transforms reality in order to keep alive the possibility that it might be otherwise and thus art is an agent of social critique and of individual transcendence.

If this new universe of piano sounds can make some small contribution to this transcendence, I shall be content.

⁹ Johnson, Julian (2002) *Who Needs Classical Music? Cultural Choice and Musical Value* (Oxford: Oxford University Press).

Addendums

Addendum 1: Extended piano techniques, sounds and visualisations.

Addendum 2: Extended piano technical descriptions.

Addendum 3: Research time line flow chart.

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