

# EMS2015: The Art of Electroacoustic Music

# The University of Sheffield June 23-26, 2015

The EMS Network has been organised to fill an important gap in terms of electroacoustic music, namely focusing on the better understanding of the various manifestations of electroacoustic music. Areas related to the study of electroacoustic music range from the musicological to more interdisciplinary approaches, from studies concerning the impact of technology on musical creativity to the investigation of the ubiquitous nature of electroacoustic sounds today. The choice of the word, 'network' is of fundamental importance as one of our goals is to make relevant initiatives more widely available. http://www.ems-network.org

June 3, 2015

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# Chapter 1

# 23.06.2015

# 1.1 Robert Bentall

## 1.1.1 Genre Hybridisation in Acousmatic Composition

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In this paper, I will attempt to explore issues of how electroacoustic music discourse can be hybridized with the language of other musical genres in order to find a new sound world that develops the language of electroacoustic composition. This is developed through a discussion of my own works *Summer Anthem* and *A Berry Bursts*.

Acousmatic music now possesses clearly developed language, based around the exploration of recorded sound materials through experimental techniques such as granular synthesis and time-stretching. It is these facets of composition that lead me to describe acousmatic music as a *genre*: it has a set of traits that seem to be paradigmatic as the basis for how to compose. These traits have effectively become contracts<sup>1</sup>, obliging the composer to undertake a set of musical decisions to validate the work as an electroacoustic composition. However, the genre is initially based on the idea of a *medium*; that is, music written for loudspeakers only. This medium is the basis for all genres of electronic music; more popular styles are also regimented by contracts, far more strictly than acousmatic works.

Within my recent works, I have attempted to lift certain 'contracts' from certain genres and mix them together within one piece. *Summer Anthem* lifts harmonic content that as inexorably linked to dance music, such as the extended interrupted cadence, presents these materials on a sound source heard in folk contexts (the mandolin) and uses electroacoustic techniques such as granular synthesis and creative surround panning to bring clearly defined electroacoustic elements in to the work. *A Berry Bursts*, which uses a pop song as its sound material, brings in to question how the term remix is paradigmatically understood. The work of artists such as Gabriel Prokofiev and Matmos demonstrates forms of genre hybridity that I built on through the incorporation of electroacoustic structures and techniques.

It would seem that acousmatic music has, for a significant period of time, lived in a vacuum in which it has offered limited musical reference to other genres of music, particularly electronic music styles. This may be due to the high art perception of electroacoustic music, which is not held by other forms of computer-based composition. Through the acknowledgement that many composers who compose within the genre have broad musical interests, genre hybridization may facilitate more varied and distinctly personal contributions to the electroacoustic domain.

<sup>&</sup>lt;sup>1</sup>Thomas Shave (2008). Communicative contract analysis: an approach to popular music analysis. Organised Sound, 13, pp 41-50.

#### 1.1.2 Robert Bentall

Robert Bentall (b. 1989) is a sonic artist based in the UK. His main output thus far has been works for multichannel sound. He is interested in aspects of genre hybridity in electronic music, remix culture, surround-sound techniques and improvisation. Rob gained a MusB (Hons.) from the University of Manchester, graduating in 2010 with the P.J. Leonard Prize for electroacoustic composition. He subsequently completed an MMus in composition at the University of Sheffield, supervised by Dr. Adrian Moore and supported by a Julian Payne Postgraduate Scholarship. In 2012, Rob undertook a 3-month composer residency at the Federal University of Rio de Janeiro, sponsored by a Santander Mobility Award. Rob was a finalist for the 2013 Franz Liszt Composition Prize in Weimar, Germany, and the inaugural Oxford/Sennheiser Electronic Music Prize. Rob was recently awarded PhD, which was undertaken at the Sonic Arts Research Centre at Queen's University Belfast. He is currently Senior Lecturer in Music Production at Leeds College of Music.

# 1.2 John Dack

## 1.2.1 Issues of Performance and Analysis in 'mixed' electronic music - the case of 'Mantra' by Karlheinz Stockhausen

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'Mantra' (1970) is a seminal work of 'mixed' electroacoustic music by Karlheinz Stockhausen. It can be argued that it is located at the conjunction of several different musical languages. There is traditional instrumentation as well as innovative piano techniques and live electronic manipulation. First, Stockhausen has written a score in standard notation for the two pianists. As such we see all the hallmarks of traditional piano writing along with expressive indications familiar to musicians such as 'poco a poco diminuendo' and 'ritardando'. These techniques are supplemented with additional playing methods consistent with the contemporary piano repertoire. Second, and of particular importance to my talk, is Stockhausen's use of a 'system' by which the piano sound is elaborated or (some might claim) deformed by the use of two ring-modulators, two sine-wave generators and a two-track tape recorder or short-wave radio receiver (plus microphones, loudspeakers and mixing desk). Each individual element of this arrangement is, of course, a necessary part of the live performance. Like many 'mixed' works Stockhausen has created a unique system the parts of which support or subvert each other. The role of 'Formel Komposition' (formula composition) is of fundamental importance to 'Mantra'. My talk will examine how the use of technology underpins this technique of composition. What, for example, is the significance of the changing sine-wave frequencies plus ring modulation at each appearance of the 'formula'? Moreover, can the use of ring modulation be described meaningfully as an 'instrumental' technique properly speaking? If so, by what criteria can we define the process as 'instrumental'? My methodology will be to examine the score paying particular attention to the interaction between the piano pitches and the ring-modulated sine-waves and the consequences this interaction has for the articulation of form at both local and global levels.

#### 1.2.2 John Dack

John Dack was born in Kings Cross, London in 1950. He worked as a photographer's assistant, gravedigger, guitar teacher and music copyist before studying music as a mature student at Middlesex Polytechnic (BA Hons). After his undergraduate studies he worked as a peripatetic music teacher in Enfield, north London. Thereafter postgraduate studies were undertaken at Middlesex Polytechnic (PhD) with further studies at City University (PGDipMIT and MSc), Goldsmiths College (MMus) and Middlesex University (MA).

John's principal research area is the relationship between the practices and theories of composers and sound artists working in the electroacoustic medium. This research is, therefore, historical as well as musical/analytical. His doctoral dissertation (completed in 1989 under the supervision of Denis Smalley) compared the theoretical framework of Pierre Schaeffer (the 'inventor' of musique concrète) with contemporary developments in German

#### 1.3. SIMONETTA SARGENTI

elektronische Musik (particularly serial thought). Much of John's research explores these tensions within postwar European music. With Christine North (an ex-Senior Lecturer in French Language and Literature at Middlesex University), he is currently engaged in translating key texts from French. They have translated Schaeffer's 'A la Recherche d'une Musique Concrète' (1952) which appeared as 'In Search of a Concrete Music' by the University of California Press. In addition, they have completed a translation of Michel Chion's exegesis of Schaeffer's theories 'Guide des Objets Sonores' (1983). This forms part of the EARS web site (an AHRC supported project initiated by De Montfort University) (www.ears.dmu.ac.uk). They are currently completing a translation commissioned by the Groupe de Recherches Musicales of Schaeffer's 'Traité des objets musicaux'. John also plans to translate important German texts from the 1950s with Dr Ralf Nuhn (a colleague at Middlesex University). In addition, with Maddalena Novati he has co-edited the volume 'The Studio di Fonologia: A Musical Journey 1954-1983' published by Ricordi.

# 1.3 Simonetta Sargenti

## 1.3.1 An example of evolution in electroacoustic music performance: Stockhausen's Solo and the creation of a soundscape

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#### Background

In our time, it is a regular occurrence, when walking outside in the city or in the country, to hear sounds or music mixed together with the noises of the surrounding environment or with other sounds. These events create something different from a simple musical work. We can rather speak of sound situations, of soundscapes and even of musical works, but not in the classical sense of 'work' as a set and defined event.

In every age there have been musical performances created for outdoor performances: square dances, theatre shows with music, entertainment in the gardens and royal parks, music used to accompany fireworks, games etc. They were all events that enriched the landscape and could be listened to carefully as an accomplished composition or simply as background sounds that were going to complete a series of more complex events. With the increased evolution of technology, the conception of musical work has gradually changed. It has become even more a sound event participant in other aspects of artistic expressions. Installations, soundscapes, are all events not only to be heard, but also associated with other aspects of perception. There are also works conceived at an earlier time that have been transformed by technology and are still relevant.

An example of this is represented by Stockhausen's *Solo* for a melodic instrument and electronics, a composition of 1966, an early time in the history of electroacoustic music. It was performed in the '60s with analogic techniques, subsequently with digital ones and now there are different experiences coming up to make from this composition even a soundscape.

### Aims of the project

The aim of this paper is to show the evolution of some electroacoustic works in time due to the advancement of technology.

The work examined will be Solo of Karlheinz Stockhausen. We will analyse:

- 1. the characteristics of both the instrumental score and of the live technologies contained in it.
- 2. the evolution of the work from the initial form realised by the composer to the current achievements in the different performances that involve the use of recent technological applications that modify in part the original features.
- 3. Some examples of different versions for wind instrument, string instrument and voice.

In each performance, the piece is recomposed differently, both in the instrumental score and in the version with electroacoustic effects. Also it can be interpreted as an 'open work'.

The electronic processing is conceived in the original version with analogic instruments and has undergone several transformations.

In the '90s, the first digital versions were realised and recently there have been new applications for the performance.

In some recent projects we have a proposal to turn the piece into a soundscape, setting it especially outdoors. The goal of our research is therefore an analysis of Solo to define its characteristics to highlight the evolution of the piece to a new function of soundscape made possible with the new technologies. At the same time we try to show the conception of the piece and the transformation of it through technological evolution. Many conclusions were reached through a 'workshop' aimed at re-composing the piece for performance.

#### **Contributions and implications**

Contributions to this research are:

1. The analysis by Stockhausen himself that provides a detailed explanation of the work and how to orient for its realization. Both the re-composition of the instrumental score and the choice of parameters for the electronic part are explained by the composer. In this explanation we can find the main rules to prepare the different versions, how to choose the parts of the score, the criteria for the timbre solutions and finally the different organisation schemes of the live electronic performance then conceived using the magnetic tape. From the initial version of the score explained by the composer we arrive today to the different versions of the live electronics realised with digital technologies. The electronics part is based primarily on the effects of delay and feedback. Already in the '90s it was possible to replace the magnetic tape with digital technologies. One of the first examples of a digital realisation is described in my article *Software for the definition of instruments in electroacoustic music: Mikrophonie I and Solo* (Bologna, 1986).

2. Currently there are many interesting solutions for the realization of the effects in recent applications that allow the performer to execute and monitor the entire performance. We will show the iPhone application realised by A. Petrolati and E. Francioni. The evolution of *Solo* toward a soundscape, a version with voice and instruments performed outside in a seascape location, derived from this application

#### Instruments and methods

All the mentioned contributions are aimed at showing the evolution of the concept of 'work' in the different versions made possible by technological evolution. Taking into account the possibilities offered by the technology that enables the performer himself to control the various stages of implementation, we have tested the construction of different versions of Solo in a workshop with different performers. Here we will show some of the highlights of the workshop and some significant results of reconstruction of the score for the performance.

#### Conclusions

Solo, written in 1966 by Karlheinz Stockhausen, a pioneer of electroacoustic music, is an example of the evolution of the concept of 'work' by means of technologies. From the beginning, in the conception of the composer himself, Solo is a piece in which we can find a character of open performance. In fact, in this work there is the possibility for the performer to organise the score in a personal way. The performer can choose inside the score the points and the passages to build his own composition. He can choose, from six different versions, his own performance version with specific characteristics. Also, one of the structural features of the piece is to be different even in each performance in the instrumental and in the electronic parts. These structural features are emphasized in the course of time by the technological evolution. In fact, the new technologies allow us to realise not only a personal interpretation of the score as in the original idea of the composer, but also a different conception of the work until we get an idea of open work and soundscape. This latter possibility has been tested recently in a waterside concert.

#### 1.3.2 Simonetta Sargenti

Simonetta Sargenti lives in Milan. She studied at the Conservatorio G. Verdi violin, composition and electroacoustic music and at the Università Statale of Milan Philosophy and Musicolgy. Since 1980 she's performer and composer especially engaged in XX century's music and interested at the applications of technology in musical

#### 1.4. PER ANDERS NILSSON

and artistic domain. From 1990 to 1997 she worked in Milan with a composer's team for musical research and production. She realised with them, the sound direction of Stockhausen's works: *Mikrophonie I, Solo* with different instruments and *Mantra*.

She is composer for instruments, instruments and live electronics, magnetic tape and recently she realised some audio-visual installations and interactive compositions. Her compositions are performed in Italy and other European countries and often she plays her owns pieces for violin and live electronics. She is active as musicologist too.

She has written articles and essays especially on 20<sup>st</sup> century music. Her most recent studies are on Nono's last works and Stockhausen's technique of "formula": *Technology and instrumental writing in Luigi Nono's latest work* (Paris 2008, Kaunas, 2010), *Application of the "formula" in Mantra of Karlheinz Stockhausen*. (Rimini 2010, Kuerten 2011, published in 2013 in Journal of Literature and Art Studies), *Dramaturgy of sound, mobile sound and digital garden as grounding concepts of multimedia works*,(Berlin 2014), *Interaction in a performance space: A changing landscape, an experience of audiovisual installation*, (Lisbon 2013).

She is professor of Music Analysis and History of Electroacoustic Music in the Conservatorio di Musica "G. Cantelli" of Novara, and she worked before in the Accademia Internazionale della Musica of Milan, Istituto Musicale C. Monteverdi of Cremona, Conservatorio di Musica "S.Giacomantonio" of Cosenza, Conservatorio "G. Rossini", Pesaro.

She is invited annually in the University of Technology of Kaunas (Lithuania) for the Conference *Music and technologies* and she held Masterclasses on electroacoustic music at the Universidade Catholica Portuguesa of Porto (Portugal), Kaunas University of Technology (Lithuania), Conservatorio Superior de Musica de Malaga (Spain). She was invited to the first workshop on Stockhausen's music "The musical legacy of Karlheinz Stockhausen" in Kuerten, August 2011 where she presented a project on *Mantra*.

# 1.4 Per Anders Nilsson

## 1.4.1 Live Listening

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# Live Listening

How do I listen, and what do I listen for? This paper discusses decision-making when improvising in sound based music.<sup>2</sup> In essence, I discuss listening from a phenomenological point of view, and a basic tenet is intentionality as Brentano defines it: a mental state directed towards an object. Theories by Merleau-Ponty and Pierre Schaeffer are important here; in particular the latter's well-known concepts sonic objects and reduced

# **Intentional Objects**

Merleau-Ponty's object-horizon structure (2002 p.'78) states that a perceived object is always seen in relation to a surrounding horizon. When I look at an object I will see it from a certain angle, and it would appears differently seen from another side. To look at an object is to "plunge" into it, which makes it possible to distinguish objects, and their relative position, from each other. The object-horizon structure may also apply to time. Present time is a fixed point in time that depends of all other times to be determined. The now retains the immediate past, as the future will do with present time. These double horizons of *retention* and *protention* (p.80) imply that the now become an identifiable fixed point in objective time. With the terms *object* and *structure*, Schaeffer (1966) defines the perceived relation between object and context. We perceive object and

<sup>&</sup>lt;sup>2</sup>Such as electroacoustic music and free improvisation.

structure by means of identification: each object is part of a context and a single object can in turn be described as a unique structure of constitutional objects, which then can be identified and described in yet smaller units:

- Every object is perceived as an object only in a context, which includes it.

- Every structure is perceived only as a structure of objects which composes it.

- Every object of perception is *at the same time* an OBJECT in so far as it is perceived as a unit locatable in a context, and a STRUCTURE in so far as it is itself composed of several objects (Chion, 1983, p. 56).

Schaeffer calls this relationship *object-structure chain*, and may either go towards the infinitesimal, or inversely, toward the infinitely big.

# Sonic Objects

One concept of Schaeffer is the *sonic object*,<sup>3</sup> which is a perceptual intentional object that can be recognized, described, and classified with respect to perceived features. Schaeffer's categorization was based upon evolution of pitch and intensity parameters in relation to time and their reciprocal relationships, and uses the two concepts *typology* and *morphology*.

Typology categorizes objects based on physical properties of a sound, which in essence are gesture types. Morphology describes, in more detail, features of sound objects, down to small timbral and/or textural fluctuations.

In addition to this first sorting, the pitch and harmonic content has to be examined. A class called mass defines if the object has a definite, complex, instable or evolutionary pitch. An object of the categories *impulsive*, sustained, or *iterative* might be paired with one with a mass of tonal, complex or varied. Moreover, a suitable object will subsequently be evaluated with respect to its morphological properties such as pitch and/or spectral content, usually referred to as timbral features when fluctuations are small, and as textural features when variations are big. The morphological parameters deal with intrinsic features of a sonic object: Shape, Mass, Grain, Harmonic timbre, and Motion. Schaeffer introduced the two concepts context and contexture: context signifies the large-scale context and contexture signifies the intrinsic features of an object (Chion, 1983, p.61). With these terms, the sonic object became central, with the large-scale context on the one side and faster sub-features on the other. The top-down nature of these concepts enables exploration from overall shape down to fine details of sound objects. Since Schaffer's taxonomy contains more than 50000 different combinations,<sup>4</sup> it is not appropriate for improvisation. However, taken as an inspiration, and as a way to understand how an improviser is listening during the course of improvisation Schaeffer's ideas are valuable.

# **Reduced Listening**

Schaeffer distinguish between ordinary listening and repeated listening. The former is divided into the four categories listening, hearing, attending and understanding.<sup>5</sup> Reduced listening is achieved by repeated listening, which enables the listener to focus on the intrinsic features of a sound, disconnected from its context. Reduced listening is a tool for investigation and for shifting listening attention intentionally, from the contextual to the inherent features of sound. Criticism of reduced listening points out the difficulty of ignoring the contextual associations of a sound. Smalley (1997) points out certain problems with reduced listening: after one has perceived very fine intrinsic audible features in a sound, it may become very difficult to regain a normal listening mode, with all references to the outside world are in place. Low- level investigation, such as focusing entirely on the background at the cost of the foreground, tends to magnify details of minor importance. When practicing a musical instrument, one practices reduced listening.

 $<sup>^{3}</sup>$ I have found four different translations of the original Objet sonore into English: Acoustic objects by Jaques Poullin (1954); sonic object is used by Gather (2003); sound objects in Hellström (2003); and sonorous objects by Godøy (2006) and in a translation from Schaeffer in Audio Culture (2004). I chose to use sonic objects since it resembles the French original.

<sup>&</sup>lt;sup>4</sup>Manning (2004) states that Schaeffer's taxonomy: "provides for some 54,000 different combinations of sonic characteristics, a daunting indication of the scale of the task facing any prospective morphologist" (p.36).

<sup>&</sup>lt;sup>5</sup>I assume this is a well-known theory, which needs no further presentation here.

# Listening in Live Situations

Being a musician in play, how do I listen? In Merleau-Ponty's terms, I plunge into an intentional object and let other aspects of the space rest, whereas the double horizons of time, retention and protention, defines the now and makes up for decision-making. Intentionally, I direct my attention toward certain qualities, an object that display itself, but I am still aware of the surrounding landscape, the horizon where it all takes place, which in fact defines the intentional object. In a performance situation there is not much time for structural sound analysis. Rather I listen and react instantly and instinctively with my body to the audible surrounding. I consciously oscillate between reduced listening and ordinary listening. I also shift my listening intention between my own playing, and let the surrounding be the horizon, while at other times I become the horizon as an accompanist and my listening intention is directed to some one else's playing. Sometimes inherent sonic features, at other times the semantics of perceived sonic output constitute the basis of the listening intention. In the case where a sonic metaphor is detected, like wind or water, most of the effort is spent on inherent sonic qualities, which is of most use if it seems important to maintain the metaphor. However, I can also listen consciously to certain qualities, notably rhythmic patterns that may catch my interest. First I try to analysis it, and then decide whether I should hook up with it or let it go. I believe that I compare the immediate aural image with my memorized personal library of sonic images. I may recognize a pattern, and based on previously learned behavior I do something meaningful with it. What first catches my interest is the character of perceived gestures and tessitura, with a focus on changes in density and pitch over time. Here Schaeffer's typology is of value. Whether a perceived gesture contains a pulse, is groove based or irregular is also important. I also notice harmonicity, whether a perceived sound is pitched or noisy. The following list is made with the aim of clarifying important dimensions of perceived sounds during improvisation. The order of the items does not necessarily correspond to analysis order; rather, analysis in real time deals with many qualities simultaneously. For example, one can analyze and define a sound as being simultaneously pitched, irregular in pulse, of mid density, and going from low to high pitch. Here follows a subjective list of listening criteria:

- Tessitura: perceived frequency register: low-high, broad-narrow.
- Gestures: pitch movement: upward, downward, or constant; density/intensity: increasing, decreasing or constant; pitch and density evolution: upward and retarding, or upward and increasing.
- Pulse: regular-irregular; stylistic references.
- Timbre/Texture: pitch-noise; dark-light; stable-unstable.
- Tonal identity: tonal-atonal; stylistic references.
- Timbral identity: sonic metaphors, wind, water, friction, metallic, wood etc.

A number of concepts that derive from Schaeffer may be discerned. When practicing live- sampling an important aspect of the musique concrete practice comes to use, that is to arbitrarily chose and cut out a sonic object of suitable length from a sound stream, taking natural discontinuities into account according to Schaeffer's *stress-articulation* principle, and making the selection. I argue that during performances I analyze sounds according to the *typology* and *morphology* qualities as defined above. In other words, I practice musique concrete in real time. All this is done in accord with the Schaefferian terminology, if not explicitly and verbally articulated as such.

#### References

Chion, M. (1983). *Guide des objets sonores: Pierre Schaeffer et la recherce musicale*. Paris, Buchet/Chastel. Godøy, R.-I. (2006). "Gestural-Sonorous Objects: embodied extensions of Schaeffer's conceptual apparatus." *Organised Sound*. Cambridge University Press, UK 2: 8.

Hellström, B. (2003). Noise design: architectural modelling and the aesthetics of urban acoustic space. Göteborg, Ejeby

Manning, P. (2004). Electronic and Computer Music. New York, Oxford University Press.

Merleau-Ponty, M. (2002 (1945)). Phenomenology of Perception. London, Routledge.

Poullin, J. (1954). "The application of recording techniques to the production of new musical materials and

forms applications to "'musique concrète" L'onde Èlectrique 34: 29. Schaeffer, P. (1966). Traité des objets musicaux: essai interdisciplines. Paris, Seuil. Smalley, D. (1997). "Spectromorphology: explaining sound-shapes." Organised Sound, Cambridge University Press, UK 1(2).

#### 1.4.2 Per Anders Nilsson

Per Anders Nilsson (1954) PhD./Professor, Vice Prefect for Research at University of Gothenburg. Improvising electronic musician and electroacoustic composer. Studied saxophone and electroacoustic music from 1981-87 at the School of Music at University of Gothenburg. In 2011 he finished his PhD thesis *A Field of Possibilities: Designing and Playing Digital Musical Instruments*. Has been played at several ICMC: Aarhus, Banff, Thessaloniki, Beijing and Miami as well as been commissioned at GRM, Paris and has also been a visiting scholar at CNMAT in Berkeley, CREATE in Santa Barbara, and CCRMA at Stanford. Nilsson was music coordinator for ICMC 2002. Was commissioned *La gamme voiture XM* by GRM in Paris 1999.

# 1.5 Laurie Radford

#### 1.5.1 Implements and Artisans: the craft of electroacoustic composition

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Since the designation "artist" is employed today to describe almost anyone with a minimal skill-set that can produce an observable outcome, perhaps the role of the electroacoustic composer, immersed in an array of complex tools requiring mastery for their artistic application, is more that of the artisan, a worker in a skilled trade making things of high quality and distinction in small quantities, usually by hand. The tools and implements of the artisan are carefully chosen to afford exploration and refinement, creation and production. The deployment of these implements requires craft and skill that is idiosyncratic to the art form and the materials of which it is made. Whether a crowded room of boxes, buttons and cables, or a lonely laptop and headphones, the electroacoustic studio represents an electronic instrumentarium tailored to artistic objectives and practices. There exist powerful paradigms established by commercial practice and prevailing consumer culture in regards to the interface and functionality of the implements of the studio environment. Yet, these models are increasingly modified by an artist agenda and an attendant social stance that considers the toolset as malleable, to be remade and repurposed to serve the requirements of a single or series of creative projects. This paper will examine the evolving artisanal environment of the craft of electroacoustic composition. A theoretical framework for an evaluation of the implements and environments of this craft will draw upon theories of technology and affordance, as well as recent developments in activity theory and the notion of concept as tool.

#### 1.5.2 Laurie Radford

Laurie Radford composes music for diverse combinations of instruments, electroacoustic media, and performers in interaction with computer-controlled signal processing of sound and image. His music has been performed and broadcast throughout North and South America, Europe and Asia. He has received commissions and performances from ensembles and soloists including Le Nouvel Ensemble Modern, L'Ensemble contemporain de Montréal, Esprit Orchestra, Aventa Ensemble, Ensemble Résonance, code d'accès, GroundSwell, Pro Coro Canada, New Music Concerts, Trio Fibonacci, Trio Phoenix, Ensemble Transmission, Earplay, Duo Kovalis, Totem contemporain, the Penderecki, Bozzini and Molinari String Quartets, and the Winnipeg, Calgary, Edmonton and Montreal Symphony Orchestras.

Radford's music is available on *empreintes* DIGITALes, McGill Records, PeP Recordings, Clef Records, Eclectra Records, Centrediscs and Fidelio Audiophile Recordings. Radford has taught composition and sonic

arts music at McGill University, Concordia University, Bishop's University, University of Alberta, City University (London, UK), and is presently an Associate Professor at the University of Calgary.

# Chapter 2

# 24.06.2015

# 2.1 Michael Clarke, Frédéric Dufeu, Peter Manning

## 2.1.1 Francis Dhomont's *Phonurgie*: A New Case Study from the TaCEM Project

| Michael Clarke                 | Frédéric Dufeu                 | Peter Manning         |
|--------------------------------|--------------------------------|-----------------------|
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Following our previous presentations on developments in the TaCEM project (Technology and Creativity in Electroacoustic Music) at EMS conferences (in Lisbon and Berlin), this year we present a Case Study based on Francis Dhomont's work *Phonurgie* (1998). Funded by the United Kingdom's Arts and Humanities Research Council (AHRC) for a duration of 30 months (2012-2015), TaCEM is investigating the relationship between technological innovation and musical creativity asking, for example, if and how new technological developments afford new ways of creating and shaping music.

Amongst a set of eight Case Studies from the electroacoustic repertoire, *Phonurgie* presents specific and important challenges for our project. Whereas in studying works by Barry Truax (*Riverrun*, 1986/2004) and Trevor Wishart (*Imago*, 2002) we have focused on music that was created using software the composers had themselves designed, Francis Dhomont operates in a very different way. He does not create his own software nor does he use a single system but adventures through a range of available resources, using hardware and software as best suits his creative purpose. This makes tracing the evolution of the music and the means by which a work was created more complex, and in many cases the process is less well documented. Nonetheless, technology is central to the creation of Dhomont's works: without it his music could not exist in the form it does. It is therefore important that such work is included within TaCEM and reflected in our overall study of the various ways in which technology has led to new musical expression.

There is a further complication in the study of *Phonurgie*. One of the key resources Dhomont used for making this work was GRM's *Syter*. Although widely used by important composers of the field, leading to a significant variety of works through the 1980s and 1990s, this system no longer exists in a fully accessible form. Even if some aspects of its functionality can still be found in GRM tools, Syter's distinctive user interface is not available any more and this is a significant part of Dhomont's technical resource for this work, providing a unique way of working with sounds and processes, and of shaping transformations. Users can explore the potential offered by one given sound source and real-time processer ('*instrument*'), by manipulating one or two-dimensional sliders ('*reglettes*') associated to some of the parameters of the chosen transformation. They are also able to define a number of presets and then place these as 'balls' ('*boules*') on a grid on the screen. It is then possible to metamorphose between the presets by moving the cursor between these balls, tracing transformational paths between a number of parameter values on the screen. A key part of our investigation therefore has been to emulate *Syter* - not only its unique transformational processes but also its graphics-based interface, and in doing so to learn how this may have influenced the composer's musical thinking in *Phonurgie*.

As in our other Case Studies, our research is also informed by research into the technical context of the work, interviews with the composer and the access the composer has kindly given us to his archives and records. Our presentation will document these resources and present an account of the composer's own reflections on *Phonurgie* and the process by which it was made, supported by examples of our filmed interviews with him. This approach is especially important with the investigation of a work that has not followed a closely prescribed technical path, but drawn on a variety of technical means, following musical imperatives that do not always correspond to a systematic technical progression. These materials help in the development of an understanding of both the technical and creative process as well as informing our understanding of the underlying poietic intentions. For instance, the composer's archives enabled us to trace recorded sequences in which he explored short fragments (from his own sound experimentations, field recordings, or excerpts from works by Guillaume de Machaut and Pierre Schaeffer) along with specific and documented processes of Syter, leading to sound reservoirs from which he could select some of the materials heard in *Phonurgie*. A striking aspect of Dhomont's general compositional method is the constitution, by recording or experimenting with technological tools, of large stocks of sound materials that are not exclusively used in the ongoing composition, but can also be reconsidered and further transformed in later works, sometimes over the very long term. This is confirmed by listening to the composer's repertoire, in which many musical materials appear recurrently, with different degrees of variation, constituting milestones over his large corpus. In regards to such a poietic approach and resulting aesthetics, Phonurgie is particularly relevant as the last piece of the Cycle du son, a tribute to musique concrète and its actors, also including Objets retrouves (1996), Novars (1989), and AvatArsSon (1998).

A further element of our research into each Case Study has involved analysis of the finished work, investigating the music itself and how the materials created in the studio are formed into a coherent and engaging composition. Whereas the other strands of our research involve learning about a work by re-creating it, rebuilding its components from the ground up, in this strand we take the finished composition and interrogate it as a completed musical work. Using our analytical software TIAALS (Tools for Interactive Aural Analysis), we explore the way the creative objectives shaped the sonic components and their interrelation. We will present our interpretation of the structure of the work and how this relates to the palette of source materials used in *Phonurgie* and range of transformational processes employed.

Finally, we will reflect on the investigative process we have employed in this and the seven other Case Studies in the TaCEM project and the significance of this approach, bringing together technical, poietic and analytical components in the study of electroacoustic music. We will assess the extent to which an approach which foregrounds the aural and the interactive as essential to the investigation of electroacoustic music enhances understanding of the repertoire.

### 2.1.2 Michael Clarke

is a Professor at the University of Huddersfield. Both as a composer and as a software developer for music he has won a number of prestigious international awards. He initiated a new approach to the analysis of electroacoustic music, Interactive Aural Analysis.

#### 2.1.3 Dr Frédéric Dufeu

is Research Assistant in Music Technology at the University of Huddersfield, where he is working on the AHRC funded TaCEM project initiated by Michael Clarke and Peter Manning. He previously worked as a Teaching Assistant in Computer Music and Electroacoustic Music Studio Manager at University Rennes 2.

## 2.1.4 Peter Manning

is a Professor at Durham University. His primary area of research is the development of electroacoustic music from its birth to the present day, embracing the evolution of the associated technology, the ways in which composers and performers have embraced its possibilities, and the scope and nature of the resulting repertory.

#### 2.2. MARTIN RITTER

# 2.2 Martin Ritter

# 2.2.1 Analyzing Music that Escapes Conventional Notation: Towards Automated Spectrogram Segmentation and Annotation

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Since the nineteenth century, the study of music has revolved around a musical score as the central representation of a work. However, in the case of much contemporary and computer music, conventional and even extended musical notation is often insufficient. Consequently, we can only access this complex and innovative music through deliberate and active listening. Reliable visual representation of important musical parameters, including pitch, duration, intensity, and attack/decay, is required to facilitate the study and evaluation of this music. Several researchers have developed computer assisted music analysis programs to facilitate further exploration of musical materials. Three such iterations by Donin (2004), Clarke, Dufeu, Manning (2014), and Burleigh, Sallis (2011) have different philosophical approaches regarding the musical analysis as well as its presentation to the user, yet all three rely heavily on the manual annotation, and description of the musical materials or spectral components in question by the analyst.

The fundamentally different strategy of this project is the automated extraction of salient musical features using both signal analysis and computer vision algorithms. An audio spectrogram decomposes a recording into frequency and time, and is therefore a two dimensional image. The computer can visually analyze this image to identify regions of interest and use pattern recognition, as well as similarity features to compare them. The objective of this current research is towards the formulation of automated, computer-assisted tools for the analysis of contemporary and computer music combining the methodologies of both musicology and computer science.

This paper will give a brief overview of traditional western classical notational practices (using staff notation) in the twentieth/twenty-first century along with the aforementioned computer-assisted analysis systems (Donin, Clarke, Burleigh). Each approach has a different stance in their analysis type and how consumers should interact with this medium and the scholarship surrounding it. The author's elaboration upon these methods and his unique approach is presented as well as a progress report on the achievements made to date. This includes the discussion of the difficulty of assigning high-level musical descriptors to abstract data sets and the examination/formulation of the nature/ontological status of this new music.

## 2.2.2 Martin Ritter

As a composer, Martin Ritter writes both electroacoustic and acoustic works and develops software tools in different languages. He has worked for theatrical productions, movie productions and has created interactive museum installations. He is an educator, teaching music fundamentals to children and has sporadically been working with various organizations as a computer programmer and audio technician. He has received scholarships like the Mildred Johnson Scholarship in Music, the Joseph-Armand Bombardier Canada Graduate Scholarship, and the Joseph and Melitta KANDLER Scholarship for Advanced Music Study and has been published in the proceedings of both the New Interfaces for Musical Expression (NIME) international music conference and the International Computer Music Conference (ICMC). He holds a DMA in composition from the University of British Columbia and is currently working towards his PhD in Computational Media Design at the University of Calgary under the supervision of Dr. Friedemann Sallis and Dr. Jeffrey Boyd.

## 2.3 Oliver Carman

# 2.3.1 Musical quotation and a recurrent sonic theme in Francis Dhomont's Cycle du Son.

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Francis Dhomont's Cycle du Son is a celebration of musique concrète and also a homage to its inventor Pierre Schaeffer. It is a collection of four works: Objets retrouvés, AvatArsSon, Novars and Phonurgie. This paper discusses two recurring elements throughout the work. Firstly, the use of musical quotation, in particular material from Pierre Schaeffer's Étude aux Objets. Secondly, it identifies a series of sound objects derived from these quotations that together form a recurring sonic theme that defines the work. Recurrences of the sonic theme are mapped and a system of classification is put forward to illustrate the evolution of the theme across the course of the work. The analysis makes use of the visual representation of sound materials and spectromorphological descriptions throughout.

The paper begins with a visual representation and analysis of the opening of Schaeffer's Étude aux Objets identifying the specific sound materials that are quoted throughout Cycle du Son. It goes on to trace the occurrence of these quotations throughout the course of the work. A concentration of quotations is noted in *Objets retrouvés*, and *Novars*, with the quotation of classic works from the electroacoustic repertoire also being observed in *AvatArsSon*. It is noted that *Phonorgie* only has one quotation of Schaeffer's material.

Three distinct sound objects that occur in *Objets retrouvés*, are identified. Through the application of spectromorphology and the visual representation of sound materials, it is suggested that these sound objects are derived from transformations of material taken from *Étude aux Objets* and referred to earlier in the paper. The analysis goes on to suggest that recurrences of these sound objects in *Objets retrouvés* follow a specific pattern that continues throughout *Cycle du Son*. This is now referred to as the *sonic theme*.

It is suggested that there are numerous occurrences of the *sonic theme* throughout *Cycle du Son*. These recurrences are identified and a system of classification suggests that the theme undergoes varying degrees of sound transformation throughout the course of the entire work. Examples are given ranging from incidences where the sonic theme is clearly recognisable to moments where is it more ambiguous. In general it is proposed that the *sonic theme* becomes further removed from its original sonic behaviour as presented in *Objets retrouvés* as the work progresses. A parallel between the concentration of quotations and the transformation of the theme is also suggested. It is noted that the higher number of quotations in *Objets retrouvés* coincides with small subtle transformations of the sonic theme whilst there is only a single quotation in *Phonorgie* but the theme appears to undergo more elaborate transformations.

The paper proposes that the sonic theme performs a variety of functions. Firstly, that it provides a link between the material quoted from Schaeffer and Dhomont's original material. Secondly, that elements of the theme provide musical landmarks and more generally, the theme gives the listener *something to hold on to* throughout a suite that is nearly sixty minutes in duration. It is further suggested that the striking nature of the the material itself is what defines *Cycle du Son* as a whole.

Finally it is recognised that the *sound types* identified by Lewis in his analysis of *Novars* do in fact reach across *Cycle du Son*. This implies that there are in fact numerous further links between the works. However, a more in depth analysis is required to illustrate this and is beyond the scope of this particular paper.

#### 2.3.2 Oliver Carman

Oliver is a lecturer in Music Technology at the University of Liverpool. He completed his first de- gree in Music at the University of Sheffield in 1998 and a Masters in Electroacoustic composition in 2004. He was awarded a PhD in electro-acoustic composition from the University of Manchester in 2011, where he was an active member of MANTIS (Manchester Theatre in Sound). Oliver's primary output is acousmatic; music composed in the studio and performed in the concert hall through multiple loudspeakers. He also composes mixed music for live instruments and elec- troacoustic sound as well as having research interests in sound diffusion, laptop improvisation, the visual representation of electroacoustic music and the music of Francis Dhomont. His work is regularly performed throughout the UK and internationally, and has also been recog-

#### 2.4. FLORENCE LETHURGEZ

nised at several international competitions including; IMEB (Bourges) 2007/2008 (Prix Residence, Selection Triuvium category), International Electroacoustic Competition "Pierre Schaeffer" 2007 (2nd Prize), Diffusion Composition Competition 2010, Limerick (3rd Prize) and Destellos Competition, Argentina 2012/2013/2014 (selection).

# 2.4 Florence Lethurgez

# 2.4.1 Word on word : Interviews with electroacoustic music composers on the written presentation of their Works

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From the fifties, electroacoustic music works as contemporary music in general, come with presentation notes introducing and giving listening keys, for specific listeners, expert or neophyte, prepared or fragile.

They are recorded on concert programs as on the discographic booklets and may be written by musicologists as by the composers themselves. It is the latter that interests us here, writing becoming a kind of subtle mirror of the work, the words to "tell the music" to listeners, categories from which the compositional "being" and "making" are expressed : more particularly intentions and writing processes. After analyzing a corpus of electroacoustic composers program notes at the EMS Network 2014, in order to update most often used processes and discursive fields, more particularly for conceptualizing the aesthetics of sound as well as to address the listener, this time we focus on the analysis of interviews with a sample of electroacoustic music composers.

According to the specific sociology "comprehensive" approach, the analysis of the interviews allows to build a typology linking the writing practices of these texts to the universe of meaning that composers combine with them. The typology obtained allows to clearly distinguish two subgroups: exclusive versus occasional composers of electroacoustic music. The exclusivity of practice makes electroacoustic music composers more sensitive, if not in a specific way, to metalanguage and listening questions, more particularly during the interview where they are asked to have a "word on their word" to have a reflective look at the words they involve to present their music.

From a spoken word to a written word, from an interview situation to a communicative situation, from an artificial framework to a natural framework, the reflexive work of the composer reveals the principles and tensions by which he is led to theorize all practices that revolve around the creation, including ones more "external" to the compositional act. We thus hypothesize that this practice and comments composers make, build up a renewed prism analysis of issues related to the field of music creation and more particularly to electroacoustic music.

## 2.4.2 Florence Lethurgez

Florence Lethurgez is Senior Lecturer in Information and Communication Sciences at the University of Aix-Marseille, France. Her research focuses on the sociology of cultural institutions and of audiences, the sociology of music and more specifically the evolution of its discursive forms of mediation (reviews, programs, analyses, etc..). She is currently researching the socio-economics of the written word (library, publishing, retail) and the sociology of their audiences in this digital age.

# 2.5 Christopher Haworth

### 2.5.1 Genres as Controversies: Analysing Art Music using Digital Methods

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Genre theory and analysis is typically seen as a methodology better suited to the study of popular, rather than art, musics. In part this is due to the influence of what Eric Drott has called the 'decline of genre' thesis, which holds that, during modernity, the task of classification and generalisation of art music met with the opposing forces of accelerating individuation and differentiation at the level of individual composers and their works, with the latter winning out. In this view, popular music, embodying what Adorno called 'standardised form', simply submits to the higher level approximations of genre more readily than the endlessly variegated forms of western art music, where each work represents both token and type (this, at least, is the ideal). But even if this were true, the decline of genre thesis rests on the faith that genre assemblages are constituted by the aesthetic and structural properties of music alone, as opposed to e.g. a social network ('the Mego sound'), instrumentarium Clive coding'), geographical region ('Japanese noise'), race ('Black music'), or some other abstract categorisation. Whatever grouping we choose, a name is always necessarily less than the varied entities - persons, record labels, instruments and so on - that it enrols into its ranks. Art or popular, there can never be a simple and straightforward identity between token and type. To attribute genre to a text must, then, entail a translation, a 'making equivalent of the uniquivalent' (Callon 1981), and its process that opens onto to the politics of genre: the possibility of contestation and controversy over genre names and their designation. This presentation will be based on some early research into the use of digital methods as applied to genre, and is related to the 'analysis' theme of EMS. These tools were developed in the field of science and technology studies, and are principally intended to trace networks of association that constellate around particular controversies as they play out in civil society, a prominent example being climate change. Each 'crawl' reveals a social network comprised of human and non-human actors, each of whom is connected by linking, and being linked to, online. By applying these methods to art musics, the idea is to see genres as themselves representing controversies, or 'issues', in musical culture, which can be visualised, compared, and analysed. For instance, what is the difference between 'lowercase' and 'microsound'? Or between 'IDM' and 'Electronica'? Writers such as Joanna Demers and Paul Hegarty have tried to navigate these thorny, contested fields by means of aesthetic theory, disentangling them from one another by identifying their abiding sonic, conceptual, and ideological concerns. Using digital methods is an infinitely cruder approach than this, prone as any data mining technique is to spurious, and always partial, results. However, I will argue in this paper that it produces insights that cannot be arrived at by more conventional means, and so represents an important new approach for musicologists. Viewed as controversies, and used in tandem with more tried and true methodologies, digital methods can enrich our understanding of the messy assemblages of genre.

### 2.5.2 Christopher Haworth

Christopher Haworth is a postdoctoral researcher on the Music, Digitization, Mediation project at Oxford University. He has published on such topics as the legacy of lannis Xenakis' late electroacoustic music (Computer Music Journal), 'extreme' computer music and Noise (Resonances: Noise and Music, Bloomsbury Press), and the history and practice of composing with 'auditory distortion products' (Leonardo Music Journal). As a composer, his compositions have been performed at ICMC, SMC, Sonorities, and Quadrophonia. In 2011 he won a Shut Up and Listen! Award for his piece 'Correlation Number One'. Christopher has held research fellowships at McGill University, Montreal and University of Calgary as a postdoctoral scholar in Network Music Composition. He is a board member of the International Computer Music Association, and editor of the association's journal, *Array*.

#### Elif Balkir 2.6

#### 2.6.1A Comparative Study of the Research Proceedings of Knut Wiggen and Pierre Schaeffer during the Foundation of EMS

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> "In fact we can be completely reassured by Wiggen's remarks: he in no way ignores the "ravine", and was actually one of the first and only people who has continually echoed my own warnings during the last ten years."<sup>1</sup> P.Schaeffer

The purpose of this paper is to study the research proceedings at EMS (*Elektronmusikstudion*) in Stockholm under the leadership of Knut Wiggen focusing more specifically on his interactions with Pierre Schaeffer approximately from 1968 to 1972. Despite a certain number of studies on EMS history, for the first time, this research aims to introduce a specific historical period of EMS through the comparison of the musical concepts of the two forerunners of electroacoustic music in Sweden and in France. The study also strives to put into perspective how Wiggen acknowledged Schaeffer's theoretical and musical thoughts and what were the diverging points as well as the similarities of their conceptions regarding the research which would widely influence the technological developments and the musical creation in their institutions EMS/GRM.

First of all, the inquiry argues that P.S. and K.W., they both proposed a sort of compositional and technical program which led the main scientific and creative directions of GRM and EMS. For instance, P.S. and his research group, they invented the concrete music by recording and manipulating the natural sounds in relation with a specific listening technique giving the priority to the ear as the main instrument, favoring the human perception. Accordingly, Schaeffer developed a new solfeggio based on his conception of listening, in order to define all kind of sounds without any notation or any causal reference, attempting to explore the musical potentialities of sound objects. Thus, Schaeffer summarized his huge research proposing a method for the composition of concrete music within his Traité (1966), which would be a great source of inspiration for Knut Wiggen.

Second, in the middle of 1960s, Wiggen, Fylkingen's chairman, proposed a curious and exciting project for the electroacoustic music composition by establishing a new hybrid studio, which would combine Art and Technology<sup>2</sup>. First of all, in his article "The Musical Background of Computer Music" in 1969, he suggested that in 20th century, the sound material- the orchestra- was replaced by the electronic sounds, the compositional technique replaced by the atonality followed by the serialism and the *instrumentarium* corresponding to the production and the distribution of the sound-the concert hall- replaced by loud speakers and the studio apparatus (Wiggen 1969, 9). In the same article, Wiggen also argued that the composer should keep the balance between those three elements since they are dependent upon one another. As for the electroacoustic music, he pointed out a need for a new compositional technique, which was suitable for the new sound material and the distribution. Moreover, this compositional technique should be fed by a good knowledge of studio apparatus in order to obtain required sounds, which was not the case in Germany during 1950s (Wiggen 1969, 12):

Electronic music – such it was developed in Cologne and other similar studios – took its point of departure from instrumental music and the technique of instrumental composition. The destruction of tonal music was to be carried out to the bitter end – out to the "lonely" sinus tone – and from there, the new music was to be built up. That construction job was unsuccessful in its first phase, because the working method, which was chosen, made no distinction between the physically conceived composition technique and the sonorous result, which was judged on quite another basis.

Schaeffer, he also agreed with Wiggen having the same retroactive point of view concerning German electronic music, referring to above-mentioned article (Schaeffer 1971, 76):

<sup>&</sup>lt;sup>1</sup>SCHAEFFER, "Music and Computers", La Revue Musicale, no.268-269, Réunion de Stockholm 8-12 juin 1970 organisé par l'Unesco, 1971, p.77.

 $<sup>^{2}</sup>$ Fylkingen is an association/a sort of venue for experimental works of contemporary music and performing arts, founded in 1930s.

 $(\dots)$ Inversely, the synthetic sounds derived from the new material resources may not suit traditional music... $(\dots)$ 

Finally, Wiggen highlighted that the first pertinent example, which kept that balance with the help of a new technique, appeared in Schaeffer's research within the concrete music. Consequently, Wiggen attempted to make a new compositional technique partly inspired by Schaefferian model by means of a new studio apparatus for the diffusion and the creation of sounds in high quality<sup>3</sup>. Furthermore, Wiggen mentioned that during the first experimentations of concrete music, the technology was not able to produce such a complex and rich sounds and as a result, he underlined the importance of the computer as an aid to compose. Although Pierre Schaeffer was always skeptical about the composition by computer, he seemed to agree with the idea of using the computer in Wiggen's perspective for the creation of new sound objects (Schaeffer 1971, 76):

Now we come to the second use of the computer - as an instrument - I should like to propose, as a contrast with respect to the preceding intentions, the point of view of an investigator who has devoted his life towards an authentic research in this field...(...)Knut Wiggen's "preliminary declarations" (...) The computer is supposed to contribute the "instrumentarium".

The second major step in Wiggen's studio project, which was greatly influenced by P.S., concerned the description of sounds for this "new music". Wiggen explained in his book De två musikkulturerna in 1972, three types of musical description (Wiggen 1972, 127): Apart from the physical description and the traditional notation, he proposed the third kind of description "Schaefferian psychological terms", which is the most efficient representation of the sound substance according to composer's perception. Therefore, Wiggen intended to make operational those psychological terms, with a computer program for producing "complex sounds" in Schaefferian way<sup>4</sup>. This project would be soon called SYNTOM (Synthèse+Traité des Objets Musicaux) in collaboration with GRM in charge of François Régnier (Teruggi 1998, 84). The first point of this idea is to analyze sounds in physical terms after their conversion into digital signals with the help of the computer. And then, the analyzed sounds would be synthesized with a synthesizer that Wiggen called "analysis/synthesis circuit" (Wiggen 1969, 12). Schaeffer also referred at Unesco Conference that the computer could be a "big analysis/synthesis circuit" like his thème/version concepts which means respectfully "natural listening/the analysis of nature" and the "reintroduction into the imitated structures of nature" (Schaeffer 1971a, 63). On the second step, if the synthesized sound was suitable with the sound of departure, the result would be examined in Schaefferian terms by a computer program in order to produce some scales creating a connection between physical and psychological description of sounds. This program would allow composer to have an access to the intended sound with these terms translated into a computer language by the apparatus. Besides, Schaeffer situated this project at the crossroads of electronic and concrete music since Wiggen conceived the idea of creating complex sounds or sounds in different types by synthesizing (Wiggen 1969, 12).

#### **Preliminary Conclusions**

- In sum, Wiggen's and Schaeffer's method, they both proposed a way of thinking for making electroacoustic music. Pierre Schaeffer's method for concrete music composition is most commonly favoring the listening side whereas Wiggen's method aims at producing sounds / making sounds favoring the usage of apparatus.
- As for Wiggen's project in collaboration with GRM, one of the main reasons, which couldn't make possible the idea, was the inability of technological possibilities during the beginning of 1970s at EMS. The second reason as defined Daniel Teruggi, was that Schaeffer's description system can not be operational for a general computing system, since his research is directly related to the human perception (Teruggi 2007, 221).
- Aside from Syntom Project and some inspirations by Pierre Schaeffer's method, Knut Wiggen realized a hybrid studio at EMS having one of the most recent technical equipment among the electroacoustic

<sup>&</sup>lt;sup>3</sup>Schaefferian model - that is to say a method for the creation of complex and rich sounds based on his listening technique and the theoretical basis of his solfeggio program, which corresponds to the typo- morphology

<sup>&</sup>lt;sup>4</sup>Wiggen in his book *De två musikkulturerna*, defined Schaeffer's terms for sound objects as "psychological terms". Since, Wiggen didn't provide us any reference or detail about that definition, I suggest that he meant the most achieved part of Schaeffer's solfeggio program, which is typo-morphology.

music studios in Europe. However, his studio installation made extremely difficult to practice the sound composition for a large number of composers during the 1970s, which provoked serious conflicts with the composers. As for Schaeffer, he left quiet quickly his research presented in the *Traité* without really proposing any connection between the descriptive level (typology-morphology- charactherology) and the practical level (analysis-synthesis) that François Bayle explained (Bayle 1976, 28):

Le Traité est une étape. Même pour la notion d'objet, il n'a pas voulu apporter un point final.(...)le Traité ne parle pas des objets en fonction, il considère les choses sous l'angle de l'observation et non sous l'angle de l'activité<sup>5</sup>.

Hence, the reception of Wiggen's and Schaeffer's method in EMS and GRM, was quite different from what they expected from composers. As a further step, this research will examine the reception of their proposal at those institutions drawing attention to the relativity of artistic achievements according to the technology, the research as well as the culture.

## References

BAYLE François, "Ce que le GRM pense du TOM", Cahiers Recherche/Musique, INA/GRM, no2, Le traité des objets musicaux dix ans après, 1976, p.27-33.

GROTH KROGH Sanne, Two musical cultures-one institution: Research strategies and text-sound compositions at the Swedish electronic music studio EMS in the 1960s and 1970s, doctoral dissertation, Copenhagen University, Søren, MØLLER, (dir.), Michael Fjeldsøe, SØRENSEN, (dir.), Per O., BROMAN,(dir.), translated in English by Juliana, HODKINSON, Isabel, THOMSON, Musicology, Copenhague, 2010.

SCHAEFFER Pierre, "Music and Computers", translated by William Skyvington, La Revue Musicale, no. 268-269, Réunion de Stockholm 8-12 juin 1970 organisé par l'Unesco, 1971, p.57-92.

(a) SCHAEFFER Pierre, "À propos des ordinateurs", exposé prononcé par Schaeffer à la Réunion de Stockholm 8-12 juin 1970 organisé par l'Unesco, La Revue Musicale, no274-275, De l'expérience musicale à l'expérience humaine, 1971, p.55-65.

SCHAEFFER Pierre, Traité des objets musicaux: essai interdisciplines, Paris, Éd. du Seuil, 1966.

TERUGGI Daniel, Le système syter : son histoire, ses développements, sa production musicale, ses implications dans le langage électroacoustique d'aujourd'hui, doctoral dissertation, Vincennes Saint- Denis (Paris 8) University, Horacio, VAGGIONE (sup.), Science and Technology of Arts, Paris, 1998.

TERUGGI Daniel, "Technology and musique conctrète : the technical developments of the Groupe de Recherches Musicales and their implication in musical composition", *Organised Sound*, Vol.12, no.3, 2007, p.213-231.

WIGGEN Knut, "The Musical Background of Computer Music", translated by Roberta Settels, Fylkingen International Bulletin, no.2, 1969, p.8-12.

WIGGEN Knut, De två musikkulturerna, Stockholm, Sveriges radio, 1972.

## 2.6.2 Elif Balkir

Elif Balkir is currently a Ph.D. student under-joint supervision of Marc Battier and Jacob Derkert at the Musicology Department of Paris-Sorbonne and Stockholm Universities. Her doctoral research explores a comparative study of the compositional ideas within the technological development at GRM in Paris and EMS in Stockholm

 $<sup>{}^{5}</sup>$ The treatise is the first step however it didn't make a final point for the concept of sound object.(...) the treatise doesn't talk about objects in practice, it considers them into the perspective of observation, the object is not situated in an operational context.

from 1965 to 1980, based on Pierre Schaeffer's and Knut Wiggen's musical concepts. Born in 1986, in Istanbul, Balkir started to her musical career at the age of eleven as a pianist. Then, she continued to her musical studies at Paris-Sorbonne in Musicology in France. Besides the theoretical background, she became interested in electroacoustic music composition, sound engineering as well as musical acoustics. To this end, she has studied at Aubervilliers-La Courneuve Conservatory, which has led her to the current doctoral work. From 2013 on, she has been living in Stockholm after getting a full-time position as a Ph.D. candidate at Stockholm University.

# 2.7 EMSAN paper session: Mikako MIZUNO

## 2.7.1 Language for Japanese Timbre as Pitch Distance by Minao SHIBATA

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#### Introduction: Japanese terms for timbre

Japanese language has three words concerning the element of sound which can be translated "timbre" in the Western sense. The three are NE-IRO, ONSYOKU and HIBIKI. Etymologically these three have different background.

Ne-IRO is a compound word of Ne and Iro. Iro means color and Ne can be alternatively translated as tone, sound, voice or timbre. So Ne-Iro can be translated "tone color", but it implies much more nuances concerning music and sound perception. We can find the example of NE in the first paragraph of Makura no Soshi-枕 草子, which is a Japanese classical literature written in the 8<sup>th</sup> century; Mushi no Ne, Kaze no Oto (sounds of the insects, sounds of wind in autumn.) In the Western culture sounds of the insects have been noisy, but Sei-Shonagon 清少納言loved it. This is an example which shows that NE 音includes special emotion of the person who uses the word.

The Kanji for OTO is same as that for NE 音. Since Heian era(794-1192), the same Chinese letter 音had two Kun-yomi 訓(a Japanese reading of Chinese letters, using the Japanese original pronunciation which has the corresponding meaning); NE and OTO. It is certain that ONSYOKU is also a compound word OTO(sound) and SYOKU (color), and NE-IRO and ONSYOKU have the same Kanjis 音色, but the two are different in the point that ONSYOKU is the modern translation from the Western word 'timbre', while NE-IRO is the traditional word. HIBIKI also means integrated sound in musical and social space.

### Seeking for Japanese style of composition and Minao SHIBATA

In my presentation, the Japanese feature of pitch and timbre will be discussed along with the terms NE-IRO, ONSYOKU and HIBIKI, focusing on a Japanese composer and musicologist Minao SHIBATA. The discussion concerning pitch and timbre in Japanese avant-garde music must be connected with a broader situation of ethnicity in three decades from 1950's to 1970's. Actually we found several important arguments about *Japanese* features comparing to the Western music among Toshiro MAYUZUMI, Makoto MOROI and Minao SHIBATA in the journal ONGAKU-GEIJYUTU. I can also quote an article of a tripartite talk of 1957 among Mayuzumi, Hiroshi AKUTAGAWA and Hidekazu YOSHIDA. In that talk, the theme of which was ethnicity in modern music, Mayuzumi claimed that his mentality was similar to the post-serial music by Stockhausen and Boulez in the sense that they were standing on the border line between the Western and the Eastern in view of philosophical identity. (ONGAKU-GEIJYUTSU 1957-12, pp.44-53). Especially Mayuzumi stressed his sympathy to Boulez's irrationalism which Mayuzumi found in Boulez's essay 'Eventuellement'. (ONGAKU-GEIJYUTSU 1958-2, pp.31-38).

Another material that shows the situation is the evolutional movements by the players of the traditional Japanese music HOGAKU. Thanks to the new wave of HOGAKU, Toru Takemitsu could seek for his original language which merged the Japanese timbre, time and space with the Western system of music in his famous November Steps for Shakuhachi, Biwa and orchestra(1958)

Minao SHIBATA explored his own way of *Japanese* composition and aesthetic contemplation supported by such background as mentioned above.

SHIBATA started his career as a member of musicians's group SHINSEIKAI, which was founded in 1946. SHIBATA was one of the first composers who had introduced twelve-tone technique to Japan. Yoshiro Irino and SHIBATA used the term ONSYOKU for *timbre* as the element of tone in order to distinguish from NE-IRO.

In 1955, SHIBATA composed *Musique concrète for stereophonic broadcast* with a NHK producer Keiji MASUI and other ten persons. He published a report titled 'An Account of Musique Concrète' (ONGAKU-GEIJYUTSU 1956-4, pp.30-35). He was a member of the founders of Music Research Center of Twentieth Century as well as a leading person of NHK electronic studio(1955). He founded a critical magazine titled *TRANSONIC*(1963-76) with Yuji TAKAHSHI and Toru TAKEMITSU.

SHIBATA explored the feature of Japanese traditional music by scientific way apart from the Wetern theory of pitch and timbre. According to Koji SANO SHIBATA's apprentice period of Western style ended with *Consort of Orchestra* (1973) and his new style started with a theatre piece for choir, *Oiwake-bushi-ko*. This piece is based on Japanese folklores and includes a lot of microtonal pitch changes as *Japanese* timbre.

#### Japanese timbre NE-IRO and SHIBATA's theory of skeletal system

The cornerstone for SHIBATA's style change was *timbre* of Japanese instruments and voice. In 1969, SHIBATA researched the Japanese folklore in Okinoshima and was certained himself that the microtonal pitch changes functioned as a timbre in Japanese traditional music. He also explored the unique theory of two-kernel *skeletal system* of KOTO tuning, which is based on the two sets of pentatonic scale and which is decisive, according to SHIBATA, to NE-IRO of KOTO.

In the prize winning piece *Oiwake-bushi-ko* the harmony is made incidentally as a result of simultaneous singing of different folkloric melodies. In order to make Japanese timbre of voices, some verbal instructions are written on the score.

As for KOTO tuning system, SHIBATA explained with the example of ROKUDAN. In a traditional music titled ROKUDAN 六段, SHIBATA found two layers(lower and upper) in the monophonic melody, even though Fumio Koizumi thought it was one monody line. SHIBATA indicated two-note sound of B-C in (figure 2.1)belonged to the different group from that of linear progression of B-A in the point of the register and the timbre. Here SHIBATA regarded the register change as the change of timbre as NE-IRO.

Another point of *Japanese* timbre as pitch change is OSAE one of the method of playing KOTO. OSAE makes the pitch higher, but the upper pitch doesn't function as the pitch itself but should be heard as the nuances or change of timbre, like a resonance in live-electronics including both pitch and amplitude changes.



#### Figure 2.1: Rokudan and OSAE

So SHIBATA realizes Japanese tone color, that is NE-IRO, of KOTO is keenly connected to register or pitch changes. NE-IRO can't be notated on the usual score, but SHIBATA cited Kiyosa Kanetsune 兼恒清

((1885-1997)) to show how the Japanese quality of timbre was related to the microtonal pitch changes and how Japanese folk culture included noise as micro tone.

Concerning the *Skeletal system* and the pitch changes as timbre nuances applied to *Oiwake-bushi-ko*, SHI-BATA explained with his terms *Konsonanz* and *Distanz*. *Konsonanz* is a consonant relation exclusively among the two notes, which in Japanese folklore is the interval of the fourth. *Distanz* is a pitch distance from *Konsonanz*. *Distanz* as pitch distance is also an unstable pitch relation compared to *Konsonanz*. The relationship between the stable tones and the unstable tones were applied to SHIBATA's live-electronic music in 1970's.

#### SHIBATA's live-electronic music

SHIBATA created five electroacoustic music during his turning point years from 1968 to 1972. All his electroacoustic pieces amount only seven, so most of his electroacoustic creation is condensed to the four years. *Display* 1, 2 are for the Japanese Pavilion of Osaka World Exhibition in 1970. *Perfect Liberty* is also an occasional piece for wind ensemble and tape.

The score for Improvisation for electric sounds was designed on paper as visual color images. According to Koji SANO, SHIBATA remembered the experience in NHK electronic studio and said;

As I used to think music as some unstable fluid which is changing itself into various forms, I enjoy creating electroacoustic music which can reveal the images of the spirit of a dead person.

Here SHIBATA used the expression the spirit of a dead person and it shows SHIBATA's preference of being unstable, as *Distanz* in Japanese tonal system.

The sole live-electronic piece by SHIBATA is Leap Day's Vigil for Ko-Kyu, San-Gen and Electro-acoustic Devices (閏月悼歌jungetsu touka 胡弓、三弦、電音響製造). This piece was created in January and February in1972, and was premiered on the third night of the 6<sup>th</sup> NICHI-DOKU(Japan-Germany) Music Festival in Tokyo. The electric device was in bad control that night, so the piece was performed again in NHK509 studio on April 5, and broadcasted. The score of Leap Day's Vigil is composed of three types of graphical notations and one sheet for the ensemble time schedule. Two types of graphic notations are bow and pitch of Ko-Kyu. The tape part was made from the sounds of Ko-Kyu and Futo-Zao. The modulated pitches in the tape part are layered on the sounds of the performers, which make unique timbre as heterophony. As Keiji AZECHI, a Ko-Kyu player who played Leap Day's Vigil several times, indicates Ko-Kyu has a dazzling timbre and it appeals to the primitive humane emotion, and the feature of timbre could be produced by irrational system by indeterminate relation between pitch and timbre.

#### 2.7.2 Mikako MIZUNO

Mikako Mizuno is a composer and musicologist. Graduated from Tokyo University(aesthetics) and Aichi Prefectural College of Arts and Music. Master degree for composition. Dr. of Engineering concerning the theme *Space Concept in the Contemporary Music*. The pieces were premiered in France(Bourges, Paris) Austria(Salzburg), Hungary(Budapest), Germany(GEDOK), Italy(International Music Festival in Venice, Alba Music Festival) Republic of Moldova(Ars Poetica), ISEA2000 and 2002, ISCM2003 and 2010, EMS2010 Changhai, Musicacoustica2010 (Beijing), ACMP2011, 2012, 2013, WOCMAT2013 and in several cities in Japan.

Japan premiers include the concerts of : GEN-ON, JFC, JSEM. Orchestral works were premiered by Tokyo Philharmonic Orch., Central Aichi Symphonic Orch., Aichi Symphonietta and so on.

Writings were published including The History of Japanese Contemporary Music After WW II (2006), Space Concept in the Contemporary Compositions (2001).

- Professor of Nagoya City University,
- Vice President of Japanese Society of Electronic Music (JSEM).
- Committee member of Japanese Society of Sonic Arts (JSSA).

# 2.8 EMSAN paper session: Qian Zhou, Ye Shen

## 2.8.1 Composition Thoughts under 3D Sound Spatialization

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This research focuses on the composition thoughts of Electronic Music under the 3D sound spatialisation. The paper will review the historical development of spatialisation research in music compositions, and the usage of various spatial techniques, then summarily compare the different sound - spatial possibilities provided by current electronic music techniques.

The paper will further study and analyse the principle and the organizational elements of composing music under the 3D sound environments, and speculate upon the implications of new spatial techniques upon future musical thought.

A series of music compositions in historical periods will be analysed, to present the multi-faceted nature of the topic: to discover the feelings of the human listener and their relationship to sound and spatiality. This research will investigate several sophisticated technical systems, such like LISP / CCRMA, Zirkonium / ZKM, IRCAM TOOLS, IOSONO, VBap, etc., to discuss the new possibilities for music creation.

## 2.8.2 Qian Zhou

ZHOU Qian, associate professor of Composition, the Assistant Director of Electroacoustic Music Center, Shanghai Conservatory. ZHOU was the Visiting Scholar of CNMAT (2012), and researched at CCRMA (2013).

### 2.8.3 Ye Shen

Ye SHEN, associate professor of Composition, Shanghai Conservatory; visiting lecturer of Hamburg Music and Theater Hochschule; visiting scholar of Berlin Arts University; studied in Ircam - Cursus; the awarder of Bach-Preis-Stipendium (2011);

# 2.9 EMSAN paper session: Liao Lin-Ni

## 2.9.1 An Example of Musical Analysis: Double-Notation

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In the post-modern era, in order to better distinguish the native voice of a composer, it is almost impossible to escape the problem of "exchange" which comes in various forms, such as transculturation, transculturality, multi-culturalism, and interculturalism etc.,<sup>6</sup> in the field of artistic creativity with different areas of research emerging from the United States since the 1980s. During the sixties, North America demonstrated remarkable dynamism with new anthropological and ethno-musicological analyses that were oriented toward the "aesthetic" and originality of the work. The "aesthetic" creates an exotic new encounter and a new approach to Far Eastern thought, qualified by John Cage as "non-Western", and in opposition to a European style tied to the historical context of musical culture. The freshness of "Conceptual Orientalism"<sup>7</sup> attempts to go beyond the historical

<sup>&</sup>lt;sup>6</sup>Apollinaire Anakesa Kululuka, L'Afrique subsaharienne dans la musique savante occidentale au XXe siècle, Paris, Connaissance et savoirs, 2007.

<sup>&</sup>lt;sup>7</sup>John Corbett, "Experimental Oriental: New Music and Other Others", in Western Music and Its Others, Georgina.

trend.

Experimentalism is found at the heart of a musical phenomenon of differentiation that welcomes the world's diversity.

The ambition of many compositions shows a research into and an affirmation of identity and is reflected in the organization of cultural exchange as is embodied by one of the first Chinese composers, Chou Wen-Chung (1923) who has lived in the United States since 1946 and who created the Sino-American Arts Exchange Center in the late seventies, as well as by Hsu Tsang-Hui (1929-2001), the first Taiwanese composer trained in France between 1954 and 1958, who embarked on many creative activities and introduced numerous exchanges between France and Taiwan during the seventies and eighties.

This ambition to welcome the world of transculturation in the field of contemporary music began to blossom in the United States and France during the sixties and seventies. France saw many creations rich in inspiration from the Far East, with a special appeal for Japan because of its openness to the West and the idea that some traditional Japanese music carries with it a contemporary energy. The situation and attitude during this period were very different in relation to Communist China, ravaged by the "Cultural Revolution", as well as across the strait in Taiwan, who in response to the chaotic political climate engaged in a "cultural renaissance movement" against China. At the same time, South Korea was emerging from its post-war period.

For many years, my research has focused on the four principal categories of Asian cultural elements and the manners in which they are employed in composition. These musical, cultural and sociological analyses are aimed particularly at works by Asian composers who have been trained abroad as well as Western composers inspired by elements from distant cultures. Many Eastern and Western composers, such as Bright Sheng, Chou Wen-Chung, Tan Dun, Xu Yi, Wen De-Qing, Zhang Xiao-Fu and John Cage are inspired by the *I Ching - Book* of Changes. The composers of Chinese origin benefit from a "double culture" or interculturality, first in their native country with strong local musical tradition, then later trained in a musical educational system that has been totally Westernized since the late nineteenth or early twentieth century, with then further periods of study in the West. How can Chinese dualism operate in Western musical composition? How does philosophy emerge into a personal theoretical organization? Or does it go in the opposite direction - organization into philosophy? Can it be nourished from one to the other? How does the composer freely come and go between both the theory and the wisdom of the *I Ching*?

At the EMS 14 Conference in Berlin last June, I developed a cultural and musical analysis of the acousmatic work Yi: Etudes des 8 Elements, by the Taiwanese composer Wang Miao-Wen (1963), who demonstrates an "anthropological cosmology", or rather, a manner of thinking that implements analogous relationships between cosmos and human. She employs the teachings of Taoist wisdom amongst the philosophical systems in her internal listening and in her musical writing. For example, the sound sources recorded inside her house with 8 mundane objects of everyday life signify the 8 essential elements of the 64 hexagrams of the *I Ching*, based on the dualist philosophy of Yin and Yang.

Here, I propose a new musical and cultural analysis of mixed music based on fundamental Taoist thought, by looking at two pieces, which are supported by this cosmological philosophy in their organization of instrumental and electroacoustic writing. The two composers, the Taiwanese Wang Wen-Miao (1963), and the Chinese Xu Yi (1963), each arrived in France at the same period to begin their study in composition at the Ecole Normale de Musique de Paris, each with different professors. Later, they each successively met Gérard Grisey (1946-1998), who became the mentor for both women. While they share certain philosophical points on the *I Ching*, each composer employs a different interpretation in their musical language issue from the complex historical background of their two native countries during the last century.

Through a double notation - cultural and musical - I will also present the characteristics of their compositions which are theoretically and philosophically integrated with thought from the I Ching as a basis for musical parameters: range, rhythm, structure, timbre, spatial, relationship between instrument and electroacoustic, etc. In order to freely express the thought and language of these two composers, between the culture of the Far East and the writing of West, an analysis of a double-notation symbolically, gesturally, and musically "decodified and recodified"<sup>8</sup> will be introduced in the presentation.

<sup>&</sup>lt;sup>8</sup>John Blacking, Music, Culture, and Experience: Selected Papers of John Blacking, University of Chicago Press, 1995.

## 2.9.2 LIAO Lin-Ni

Lin-Ni Liao is a composer, musicologist and an Associated Researcher at the Institut de Recherche en Musicologie (Université Paris-Sorbonne - CNRS)

Taiwanese-French composer, Lin-Ni Liao, PhD in musicology and Associated researcher at the Institut de Recherche en Musicologie (Université Paris-Sorbonne, CNRS), is the artistic director of TPMC (Toute Pour la Musique Contemporaine) in Paris. She questions interculturality in all fields of her work, composition, artistic production, and academic research, the latter of which focuses on musical analysis, artistic identity, cultural heritage, and the role of women in contemporary music from the Far East. She has published three books including: *Pensée et langage musical d'Edith Lejet* (Ed. OMF, 2010), *Héritages culturels et pensée modern. Les compositeurs Taiwanais de musique contemporaine formés à l'etranger* (Ed. Delatour, February 2015) and *Fusion du temps : passé présent, Extrême Orient - Extrême Occident* (Conference material coedited with Marc Battier, Ed. Delatour, March 2014), and has written many articles about musical analysis as well as entries for the Taiwan section in Dictionnaire des creatrices du monde (Editions des femmes, 2013). https://paris-sorbonne.academia.edu/LiaoLinNi

## 2.10 EMSAN paper session: Ruibo Zhang

## 2.10.1 Electroacoustic Terminology Research Focusing on English to Chinese Translation within Original Contexts

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Terminology translation as the key element in my research, "Assisting the Development of the Field of Electroacoustic Music Studies in China", has been upgraded into terminology research by introducing a new method called CHEARS (China ElectroAcoustic Resource Survey) Dictionary and Machine Translation supported by a China Scholarship Council grant (CSC). The CHEARS Dictionary not only collects terminology from the well-known ElectroAcoustic Resource Site (EARS) and The Pedagogical ElectroAcoustic Resource Site (EARS 2), but also collects the important words from the EARS glossary and EARS 2 tutorials. The terms in the CHEARS dictionary will be given only one, at most two definitions (mostly translations —EARS can have several). Technically, Machine Translation allows for EARS terminology to be separated into single words, by way of searches within the CHEARS Dictionary. If there is an entry of the word in the dictionary, it will be substituted by the counterpart in Chinese; otherwise it will be kept in the original form (English). Of course, grammar is not taken into consideration at this point; the original sentence order in English will be kept prior to human editing.

The two EARS sites are both run by the Music, Technology and Innovation Research Centre, MTI, at De Montfort University, Leicester, UK; however, EARS 2 takes a different path from the original EARS initiative which is a multilingual internationally peer-reviewed professional (multilingual) glossary with an accompanying subject index for electroacoustic (EA) music as well as a bibliographic resource. The goal of EARS 2 is to assist young people in learning about and subsequently gaining interest in composing music with sound. The archetype of CHEARS Dictionary and Machine Translation (MT) also involves a pair of dynamic websites, CHEARS.info (simplified Chinese and English) and CHEARSdotinfo.co.uk (traditional Chinese and English), as its method of representation. One is hosted in Beijing and optimised for Chinese users with a registered ICP license (Internet Content Provider that is a permit issued by the Chinese Ministry of Industry and Information Technology to permit China-based websites to operate in China); the other is hosted in London and optimised for European users (and those who are stronger in simplified Chinese). The latest research environment uses a MySQL database as an intensive search engine for speeding up the potential latency of Machine Translation. Since the end of 2014 this system is fully functional; it is not only including a multi-user communication area, a text resource, events and music criticism sections for presentation, but also turns the database into

a research-oriented one. In other words, the CHEARS Database is triggered online by researchers through the research-based dynamic website portal (chears.info and chearsdotinfo.co.uk) in real-time. It has turned a translation project with the presentation-oriented website into a research-oriented database project presented through a research-based dynamic website portal. Finally, the processing of database (Microsoft Access and MySQL) and website built under the  $C\sharp$  and .NET Framework is the research itself.

CHEARS Dictionary and MT are mainly applied to the translation of EARS site from English to Chinese as the first goal. There are more than 1,200 words as vocabulary in the CHEARS dictionary at the moment and the number will be increased continuously as the database expands. Of course, it will never be a substitute for human. Therefore, human editing will be applied prior to publication on the sites. It will save a considerable amount of time for translators, proof readers and project consultants base on the original work flow. This new combined work flow (MT plus human editing) can ensure that every term is translated under peer review, and assist researchers not to make any arbitrary decisions regarding terminology. All in all, the CHEARS Dictionary and MT are only suitable for researchers and musicologists who are bilingual in English and Chinese. The content is generated by and for researcher sin EA music precisely and the intention is that the results are totally different from commercial multilingual applications or web-based plug-ins. The whole process is described as MT plus human editing, which is also known as Computer-assisted or Computer-aided Translation (CAT).

In the combination of EARS and EARS2, there are approximately 70,000 words in the CHEARS Database including the description of more than 700 e-a terms. Until now, 27,000 Chinese words have been translated and the description of more than 200 terminologies are depend on traditional method in natural language translated by 26 human translators and 6 proofreaders covering one third of the total data amount. In the CHEARS Dictionary involving MT, it is not sufficient any more to only get 750 terminologies indexed in macro-level; instead it takes any useful words among 70,000 words is incredibly low; this is the most important reason to the difficulty of understanding to the translated material by Chinese readers. This systematic problem exists obviously after having been dealing with the translation outcomes from previous years. Since the grammar has to be taken in account in the process of human translation in natural language, that will get the original context more or less encoded again and again to confuse readers. Instead of being confused by language phenomenon unpredictably, this method of terminology research will solve the systematic problem. The CHEARS Dictionary with MT takes a much closer look at each single word in the atomic level with highest resolution. This talk will include examples demonstrating the method presented in this talk.

### 2.10.2 ZHANG Ruibo

Zhang Ruibo (Mungo) is doing his doctoral research (CHEARS) with Prof. Leigh Landy under the State Scholarship Fund by China Scholarship Council (CSC) as a full-time PhD at De Montfort Univ. (DMU), Leicester UK. He also teaches electroacoustic music composition and theory at China Shenyang Conservatory of Music. He had his master's degree with Prof.Zhang Xiaofu and Kenneth Fields in China Central Conservatory of Music (CCOM). He was one of the translators for completing Chinese version of The Computer Music Tutorial (Curtis Roads) and The Study of Orchestration (Samuel Adler).

His work, *New Ambush on All Sides*, awarded by Beijing MUSICACOUSTICA festival 2005 and was performed at Audio Art Festival 2007, Krakow Poland; Synthese Festival 2008, Bourges France; as well as Salle Oliviere Messian, Radio France, Paris. In March 2010, his new piece Birth (Audio-Visual) was performed (World Premiere) in the Concert of Central Conservatory of Music, Beijing —Chinese Electroacoustic Music Center amongst The MTI 10th-Birthday Series at De Montfort University, Leicester UK.

His research, CHEARS (China ElectroAcoustic Resources Survey), was selected into EMS07 conference, and he presented the research at De Montfort University, Leicester UK. After this, he continues his research: CHEARS.info, and presented it at the EMS08, EMS 10 and EMS 11 conference in Paris, Shanghai and New York respectively.

As Foreign Liaison Secretary, he successfully worked in MUSICACOUSTICA-Beijing Festival since 2005, as well as EMS Conference (Electroacoustic Music Studies Network) in 2006 and 2010 at Beijing and Shanghai respectively.

# Chapter 3

# 25.06.2015

# 3.1 Viviane Waschbüsch

## 3.1.1 The influence of Tibetan Buddhism in the work of Eliane Radigue

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French electronic music composer Eliane Radigue studied electroacoustic music techniques at the Studio d'essai at the RTF, under the direction of Pierre Schaeffer and Pierre Henry from 1957-58. In 1967-68 she worked again with Pierre Henry, as his assistant at the Studio Apsome. From 1970-71 Radigue worked for a year at the New York University School of the Arts. In 1973 she was in residence at the electronic music studios of the University of Iowa and California Institute of the Arts.

Becoming a Tibetan Buddhist in 1975, Radigue went into retreat, and stopped composing for a time. When she took up her career again in 1979, she continued to work with the Arp synthesizer which has become her signature. She composed *Triptych* for the Ballet Theatre de Nancy (choreography by Douglas Dunn), *Adnos II* and *Adnos III*. In 1984 Radigue received a "bourse a la creation" from the French Government to compose *Songs of Milarepa*, and a "commande de l'état" in 1986 for the continuation of the Milarepa cycle with *Jetsun Mila*.

Having been inspired by Buddhist philosophy and mythology she composed *Trilogie pour la mort* inspired by the Bardö-Thödol — the Tibetan book of death. Radigue's cycle is organized in three major sections which she called chapters: I. *Kyema* (1988), II. *Kailasha* (1991) and III. *Koume* (1993). The first chapter *Kyema* is dedicated to her son Yves Arman who died in the year of composition of the piece. *Kyema* is a description of the six different stages that constitutes "continuous existence" of the human being. That's why the piece is organized in six sections related to the Buddhist view of life and death: I *Kyene* (birth), II *Milam* (dream) III Samten (meditation), IV *Chikaï* (death), V *Chönye* — (bright light), VI *Sippaï* (transit and coming back).

The second chapter *Kailasha* is not directly linked to the Tibetan philosophy but inspired by certain paintings of Albers and Escher in which space is explored in a logical and paradox way at the same time. The working title of the second chapter was *Hereafter* but Radigue changed her mind and decided to create a link in the title with the Mount Kailash, the holy mountain in the Himalayas, that is considered in Buddhist tradition as the place where the soul migrates from life to death.

*Koume*, the third chapter of this cycle that is mostly inspired by the bible and some quotations from sacred music. This chapter is divided in four sections. The first section has the title of Psalm XXXIV "Human is only walking in appearance", the second section is a latin quotation from a missa da requiem "Qua resurget ex favilla judicandus homo reus". The third section is inspired by the St Matthew Passion "Have lightning

and thunders their fury forgotten" and the last section is imbued by the Corinthian XV "Death where is your victory?". Radigue explained that Koume is not an existing Tibetan word:

"C'est du tibétain de cuisine, Me c'est le feu et Kou, le corps sacré. Cela n'existe pas en tibétain."<sup>1</sup>

In this presentation the development of Eliane Radigue in her Buddhist inspired period from 1984 to 1993 will be analyzed and the realization of Tibetan Buddhist concepts in *Triologie pour la mort* (1988-1993), *Songs of Milarepa* (1984), *Jetsun Mila* (1986) is explored. In addition it will be depicted how Radigue's aesthetic points of view were influenced and transformed through these philosophical concepts.

#### 3.1.2 Viviane Waschbüsch

Viviane Waschbüsch (b. 1989) is a graduate of the Paris-Sorbonne University and the Saarland University, where she received both her Maîtrise and Masters degrees in Music and Musicology. She studied with Wolfgang Rihm at the Musikhochschule Karlsruhe and received a Masters degree in composition with violin as principal instrument. She is laureate of the 2008 "Jugend Komponiert" in Germany as well as of the 2005 Alois Kottmann International Prize for Violin in Frankfurt. Since 2011 she worked as a lecturer at the Department of Musicology at the University of Saarland where she taught history of composition, analysis of tonal music and analysis of contemporary music. Since 2013, she studies with Prof. Marc Battier to accomplish her PhD at the Paris-Sorbonne University. At Paris-Sorbonne University she has a doctoral contract and teaches analysis and ear training.

# 3.2 James Mooney

3.2.1 Materiality, Economy, Community: Hugh Davies's Electronic Musical Instruments and their Relation to Present-Day Live Coding Practice

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## Abstract

In the 21st century, it seems that Hugh Davies's innovatory, do-it-yourself, lo-fi approach - which in several respects prefigured present laptop culture - is finding favour with a younger generation to whom this remarkable and iconoclastic innovator now appears as a significant father figure.<sup>2</sup>

As part of an AHRC Fellowship project in collaboration with the Science Museum this paper will explore the self-built electronic musical instruments of Hugh Davies (1943-2005) and their relation to present-day electronic and digital instrument-building practices. The development of Davies's practice as an instrument builder will be outlined and a number of Davies's instruments will be described, with emphasis placed upon the cultural values and ideologies that the instruments embody. Points of contact with present-day live coding practice and its attendant ideologies will be proposed, focusing upon common themes of: **materiality** - the physical characteristics of objects versus the 'material' constraints of computer code; <sup>3</sup> **economy** - maximal exploitation of minimal resources, whether through physical recycling and repurposing or through algorithmic efficiency; and **community** - collaborative instrument-building workshops versus collaborative open-source software projects. Through my discussion I will demonstrate how many of the current/recent concerns of live coding were foreshadowed in the approach Davies took to building and performing with his instruments.

<sup>&</sup>lt;sup>1</sup>GIRARD, Bernhard, *Entretiens avec Eliane Radigue*, Editions Aedam Musicae, 2013, p. 97. "It's not real Tibetan Me means fire and Kou holy body. It does not exist in Tibetan." (personal translation).

<sup>&</sup>lt;sup>2</sup>Keith Potter, 'Hugh Davies: Iconoclastic Innovator in Electronic Music', Independent, 7 January 2005.

<sup>&</sup>lt;sup>3</sup>Thor Magnusson, 'The Materiality of Code: Code as Literature', presented at Musical Materialities conference, Sussex, 2014.

## Background

Between 1967 and 2001 Davies built more than 120 electroacoustic musical instruments that 'incorporate[d] found objects and cast-off materials'<sup>4</sup> such as kitchen utensils, plastic bottles, the lids of jam jars, envelopes, matchboxes, rubber bands, and many other items that might normally be considered 'junk.' This practice arose out of his desire to pursue interests in live electronics and tape music composition following two years working as personal assistant to Karlheinz Stockhausen (1964–66). Conceived of as 'musique concrète synthesizers', Davies's instruments were, on the one hand, designed to generate new and interesting sounds for use as material in tape compositions.<sup>5</sup> On the other hand, Davies was inspired by his participation in performances of Stockhausen's live electronic works, such as *Mikrophonie I*, and found that his instruments could equally well be played live. Lacking equipment and funds, Davies built his instruments using essentially whatever materials came to hand. Among the first of his constructions was a device called the 'Shozyg,' built in 1968, which comprised a selection of electronically amplified springs, hacksaw blades and ball-bearings housed inside the cover of an encyclopaedia with the pages removed. (This volume covered alphabetic topics in the range SHO–ZYG, hence the instrument's name; the book itself—so the story goes—was literally found lying in the street.)

Born out of necessity, recycling went on to become a central component of Davies's ethos. There developed a clear connection between the musical recycling/repurposing of throw-away materials, and an interest in wildlife and the natural environment,<sup>6</sup> and Davies came to favour modes of production were environmentally sensitive, modest and frugal, ecologically sustainable. Through his practice as an instrument-builder he aimed to show that 'the riches of our planet do not need to be consumed and thrown away so quickly.'<sup>7</sup>

#### Materiality

Since Davies's instruments were built from whatever materials happened to be at hand (in some cases an instrument was nothing more than a single found object) it follows that their design and use in performance must proceed via an exploration of the musical possibilities of those given materials. Materiality—an emphasis on exploring physical characteristics and the musical possibilities that they afford—is thus central to understanding Davies's work as an instrument builder:

Davies's ideas for instruments usually arise out of the materials themselves...<sup>8</sup>

What he requires of anyone who plays his instruments is that he or she should become sensitive to what the instrument is capable of doing and what is natural to it...<sup>9</sup>

When he talks about his work it is noticeable that Davies constantly uses phrases like "the instrument tells me what to do", "the materials show me how it should be".<sup>10</sup>

In this sense the materials themselves—the instruments—could be regarded as prescriptions for, or abstract descriptions of, the potential compositions or performances that could be realised by playing them. Bell even goes so far as to suggest that

There is good reason for considering [Davies's instruments] as compositions in their own right, since in effect the construction of the instrument determined the way in which a performance was executed...<sup>11</sup>

<sup>&</sup>lt;sup>4</sup>David Roberts, 'Davies, Hugh (Seymour) (ii)', in New Grove Dictionary of Music and Musicians (London: Macmillan, 2001), pp.61–2 (p.61).

<sup>&</sup>lt;sup>5</sup>Hugh Davies, 'Invented Instruments and Improvisation', Avant: Jazz, Improvised and Contemporary Classical Music, Spring 1997, pp.12–15 (pp.12–14).

<sup>&</sup>lt;sup>6</sup>Hugh Davies, 'My Environmental Music', in *Sounds Heard* (Chelmsford: Soundworld, 2002), p.48.

<sup>&</sup>lt;sup>7</sup>Hugh Davies, 'The Aims of My Musical Projects for Children', in *Sounds Heard* (Chelmsford: Soundworld, 2002), p.96.

<sup>&</sup>lt;sup>8</sup>David Roberts, 'Hugh Davies: Instrument Maker', Contact (17, Summer 1977), pp.8–13 (p.10).

 $<sup>^{9}</sup>$ Roberts, 'Hugh Davies: Instrument Maker', p.8. The instructions for Davies's 'Shozyg' instrument represent one good example of this.

<sup>&</sup>lt;sup>10</sup>Roberts, 'Hugh Davies: Instrument Maker', p.11.

<sup>&</sup>lt;sup>11</sup>Nicolas Bell, 'Sounds Heard: The Music of Hugh Davies', in *Media inter Media: Essays in Honor of Claus Culver*, ed. by Stephanie A. Glaser (Amsterdam and New York: Rodapi, 2009), pp. 231–44 (p.241).

The centrality of materiality provides an important point of contact between Davies's instruments and present-day live coding practice, in which a computer is programmed in real time to generate music in a live performance setting. According to Magnusson, a programming language can be considered 'material' since it provides 'an unequivocal representation of the machine state.' Code, by extension, 'can thus serve both as a prescription and an abstract description of *potential* machine states' (emphasis added). In this way the programming language 'lays out potential structures of algorithmic thinking', that is, it defines the ways in which musical development over time can take place. In live coding, as in Davies's instruments, material characteristics lay out the potential structures of musical thinking and define the ways in which the music can unfold over time.

#### Economy

Davies's instruments were economical in the sense that they utilised minimal resources, found, recycled, or cheaply available. His 'Music for a Single Spring' (1975), for example, was performed using an instrument comprising a single 85 cm spring and four magnetic pickups,<sup>12</sup> while his 'Larchcone Clickers' (1977) were simply larchcones found on the ground and played with the thumbnails.<sup>13</sup> The mode of performance was characterised by the maximal exploitation of these limited resources, such that the range of sounds attained would often belie the simplicity of the materials employed. (Davies believed that 'the challenge for an instrument builder is to obtain the best sonic result from [a] basic set of sound sources.'<sup>14</sup>)

Economy, and the maximal exploitation of minimal resources, represents another point of contact between Davies's work and the practice of live coding. In live coding, the computer code that determines the sound generation and musical structuring must be typed out in real time as the performance proceeds. For this reason, economical code that can nonetheless yield a diverse range of musical results is desirable. As Sorensen and Brown explain:

The limitations of how much typing can be done during a live performance mandate parsimonious solutions for both musical and systems design considerations... [T]he utility of a limited set of processes across a variety of circumstances is important.<sup>15</sup>

For this reason, Sorensen and Brown's work relies upon 'simple processes that can be combined to yield rich musical results.'<sup>16</sup> In live coding, as in Davies's instruments, minimal materials are exploited to yield the maximum range of possible musical results.

#### Community

Davies considered the electronic music studio environment to be élitist—an 'ivory tower'—and, as a riposte, 'began to make instruments [...] that anyone could play and enjoy.'<sup>17</sup> As well as playing them in his musical performances, Davies regularly exhibited his instruments in art galleries, where 'visitors to his exhibitions are always encouraged to play the instruments for themselves.'<sup>18</sup> With a pedagogical slant, and similarly underpinned by an inclusive, participatory, collaborative ethos, Davies's also ran instrument-building workshops for children:

What he attempts to do is not to instruct the children, but to collaborate with them, to say, "This and this are the possibilities; anyone with open ears and open eyes can take up such ideas and develop them in his or her own way." His approach is effective, he feels, because it is of equal value for both musically trained and untrained children: the musically literate are slightly subverted and opened up to the wider possibilities that exist, and the musically illiterate can find a way into music without having to learn an instrument in the traditional way.<sup>19</sup>

<sup>13</sup>Hugh Davies, 'Seven Portable Found Instruments', in *Sounds Heard* (Chelmsford: Soundworld, 2002), pp.41–3 (p.42).

<sup>&</sup>lt;sup>12</sup>Hugh Davies, Warming Up with the Iceman (Erkrath: GROB, 2000), audio CD.

<sup>&</sup>lt;sup>14</sup>Hugh Davies, 'New Musical Instruments', in *Sounds Heard* (Chelmsford: Soundworld, 2002), pp.31–32 (p.31).

<sup>&</sup>lt;sup>15</sup>Andrew Sorensen and Andrew Brown, 'aa-cell in Practice: An Approach to Musical Live Coding', in *Proceedings of the International Computer Music Conference*, 2007, p.2.

<sup>&</sup>lt;sup>16</sup>Sorensen and Brown, p.2.

<sup>&</sup>lt;sup>17</sup>Roberts, 'Hugh Davies: Instrument Maker', pp.8–9.

<sup>&</sup>lt;sup>18</sup>Roberts, 'Hugh Davies: Instrument Maker', p.9.

<sup>&</sup>lt;sup>19</sup>Roberts, 'Hugh Davies: Instrument Maker', p.10.

Among Davies's aims was to [...] promote co-operation instead of competition...<sup>20</sup>

A similar collaborative, community-spirited ethos is evident in much live coding practice, not least due to the widespread use of open-source software frameworks. Consider the following statement from the Toplap website:

Live coding is inclusive and accessible to all. Many live coding environments can be downloaded and used for free, with documentation and examples to get you started and friendly on-line communities to help when you get problems.<sup>21</sup>

It is common practice in live coding performances to video-project the computer screen so that audience members can see the code being typed in.<sup>22</sup> Although there is some debate as to how effective this is, the intention is to break down performer/audience barriers and facilitate understanding of programming environments. Similarly, Davies was known to project video images of his hands during performances with his self-built instruments.<sup>23</sup> In Davies's work, as in live coding, as in Davies's work, one gets the impression of democratic community in which hierarchical relationships are broken down in favour of more inclusive, collaborative alternatives.

#### References

Bell, Nicolas, 'Sounds Heard: The Music of Hugh Davies', in *Media inter Media: Essays in Honor of Claus Culver*, ed. by Stephanie A. Glaser (Amsterdam and New York: Rodapi, 2009), pp. 231–44.

Davies, Hugh, 'Invented Instruments and Improvisation', Avant: Jazz, Improvised and Contemporary Classical Music, Spring 1997, pp.12–15.

Davies, Hugh, Warming Up with the Iceman (Erkrath: GROB, 2000), audio CD.

Davies, Hugh, 'New Musical Instruments', in *Sounds Heard* (Chelmsford: Soundworld, 2002), pp.31–32.

Davies, Hugh, 'Seven Portable Found Instruments', in *Sounds Heard* (Chelmsford: Soundworld, 2002), pp.41–3.

Davies, Hugh, 'My Environmental Music', in *Sounds Heard* (Chelmsford: Soundworld, 2002), p.48. Davies, Hugh, 'The Aims of My Musical Projects for Children', in *Sounds Heard* (Chelmsford: Soundworld,

2002), p.96.

Magnusson, Thor, 'The Materiality of Code || Code as Literature', presented at *Musical Materialities* conference, Sussex, 2014.

Potter, Keith, 'Hugh Davies: Iconoclastic Innovator in Electronic Music', Independent, 7 January 2005.

Roberts, David, 'Hugh Davies: Instrument Maker', Contact (17, Summer 1977), pp.8–13.

Roberts, David, 'Davies, Hugh (Seymour) (ii)', in New Grove Dictionary of Music and Musicians (London: Macmillan, 2001), pp.61–2.

Sorensen, Andrew and Brown, Andrew, 'aa-cell in Practice: An Approach to Musical Live Coding', in *Proceedings of the International Computer Music Conference*, 2007.

Toplap, 'About Live Coding and TOPLAP', *Toplap* website, 2011, http://toplap.org/about/ (accessed 28 January 2015).

#### 3.2.2 James Mooney

James Mooney is a lecturer in Music Technology at the University of Leeds, where he specialises in the history of electronic music. He currently holds the position of visiting Research Associate at The Science Museum, London, and has previously held positions as Edison Research Fellow at the British Library, and visiting researcher at the Stockhausen Foundation, Germany. In the early 2000s he designed and built multi-loudspeaker sound-diffusion systems for electroacoustic music performance, which are still used in the UK and abroad. The main focus of his current research is an exploration of the work of musician and musicologist Hugh Davies (1943-2005), in particular his self-built instruments and musicological research. Recent side projects include an article on music technology and affordance theory, and a book chapter exploring the work of the UK-based noise artist Filthy Turd. His research is currently funded by the Arts and Humanities Research Council.

<sup>&</sup>lt;sup>20</sup>Roberts, 'Hugh Davies: Instrument Maker', p.10.

<sup>&</sup>lt;sup>21</sup>Toplap, 'About Live Coding and TOPLAP', Toplap website, 2011, http://toplap.org/about/ (accessed 28 January 2015).

 $<sup>^{22}</sup>$ Sorensen and Brown, p.7.

<sup>&</sup>lt;sup>23</sup>Davies, 'Invented Instruments and Improvisation', p.13.

# 3.3 Robert Dow

## 3.3.1 Risk and Electroacoustic Music

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Certainly since the end of the Second World War and increasingly during the 1980s (and onwards), the concept of risk has gained a great deal of general significance. There has been a growing awareness of potential risk within our society—the 'risk society'—ultimately leading to the proliferation of procedures for both risk assessment and management. This has necessitated the creation of a such things as mechanisms for determining risk liabilities and for calculating concomitant levels of compensation in situations where risk has not been mitigated against adequately.

Contemporary society, faced with the ambiguity and insecurity of its self-created future, has reacted by endeavouring to gain increasing control over its perceived risks. Indeed, by replacing the more open notions of, for example, danger or threat with the concept of risk, there has been a shift in emphasis from the incalculable to the (seemingly) calculable and thus from something which appears uncontrolled, to that which appears to be controllable. Preventative measures are being put in place by society to curb anticipated risks even where the existence of such risks cannot be properly demonstrated. Thus increasingly, a general attitude of precaution is being assumed in response to apparent risks. Both the increasing number of institutional safe-guards acting to control risk and the general precautionary milieu, unsurprisingly affect most areas of society, including the arts.

Music's creative risk is controlled in a number of ways. From a commercial perspective, there are naturally the financial risks associated with the performance and distribution (radio, television, Internet, recordings) of the music 'package': the concerns of commercial music are those of any business, and market trends shape creative outputs, limiting the scope of any experimentation.

The institutionalisation of non-commercial music in various ways, through, for example, public funding by arts councils or charities and its movement into the academy (particularly relevant to electroacoustic music) also controls creative risk. The institutional mechanisms of accountability not only endeavour to constrain creative projects to specific goals (themes) and pre-planned intentions, they are designed to mitigate the risk of failure generally.

In the context of such controlling environments, music can no longer be allowed to fail: it is either subjected to protective constraints or is encapsulated within a 'conceptual contact', the concept taking the place of, as it were, the music proper, dissipating its creative risk. In this case, we need no longer assess a piece of music on its own musical merits, but on how well it meets is conceptual obligations, allowing creative risk to be more easily mitigated.

Furthermore, the development of electronic mass storage devices, in conjunction with the easy search and retrieval mechanisms which in particular networked technologies provide, has led to a wide-spread access to a glut of information. The prevalent use of the Internet has changed the way in which information is gleaned and both our contact with and understanding of creative material. The Internet has become a single point of trusted information: we both trust that the information may be found within the archive and we increasingly trust its provenance. Additionally, the Internet has the potential to provide familiarity with a cornucopia of unrestricted material. Much which was once easily censored by the state, is now essentially openly available, even despite recent state interventions.

The electronic archive provides another mechanism for the reduction of perceived risk, both by creating a trust in its content, and by familiarising its users with a diverse range of uncensored material, providing them with immunity from the 'toxic shock' (the risk) of the novel. Creative material need no longer be anchored to a particular cultural context and the associated risks of its being culturally misunderstood, but can instead be mashed up, risk free.

This paper will explore the effect that our increasing awareness of and response to risk has on the composition of experimental music in general, and on electroacoustic music in particular. It is the aim of this initial exploration to examine two broad but interconnected questions: how the composition of experimental music

#### 3.4. RICCARDO WANKE

may be influenced by an environment in which society wishes to control risk so carefully, and how it may be affected by an progressively more straightforward access to an ever increasing electronic archive. These investigations will be carried out while taking into consideration the concept of risk in the wider context of the arts in general, for example within film.

## 3.3.2 Robert Dow

Robert Dow (b. Oakland, 1964) is a composer of electroacoustic music working in Scotland. He graduated with degrees in Science, Music, Law and Film Studies at the University of Edinburgh, and holds both an MA and a PhD from the University of Birmingham where he studied under Jonty Harrison. Formerly, he was a member of BEAST—Birmingham ElectroAcoustic Sound Theatre—and with them, has participated in numerous concerts of electroacoustic music throughout Britain.

His present musical output is predominately acousmatic in nature, concentrating principally on the use of strongly associative sounds whose origin may be easily discerned, for example environmental sounds, instrumental sounds and vocal sounds. He is also concerned with the aesthetic and technical problems that the performance of electroacoustic music brings, particularly where real-time spatialisation of such music is involved.

Robert Dow is currently a student of Biotechnology at the University of Edinburgh.

# 3.4 Riccardo Wanke

## 3.4.1 A cross-genre analysis of the (ec)static music

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## Abstract

This paper looks over a selection of pieces belonging to distant genres of today's music, in order to identify common practices to approach sound. Through audio, spectral and score analyses, this study examines essential musical elements (e.g. pulse, spectral properties, dynamic contrast, spatial arrangements) their characteristics and effects.

This method has been applied to post-spectralist and minimalist compositions (e.g. G. F. Haas, B. Lang R. Nova, G. Verrando), as well as glitch, electronic and basic-channel style pieces (Pan Sonic, R. Ikeda, Raime). The analysis reveals nine musical attributes that are common within the selection of pieces. These attributes indicate parallels, similar perspectives and a common affinity among different genres. The study contributes essentially by minimising artistic distances and establishing shared musical conceptions.

#### Introduction

During the last century, various currents of experimental music progressively moved toward a more explicit interest to sound and its characteristics: some scholars refer about a timbre's evolution to the exploration of sound (Bériachvili 2008, Solomos 2013). Starting from the mid-twentieth century, several musical elements (e.g. non-teleological perspectives, the fusion of electronic/acoustic/concrete sounds, the extended use of sound spectra) were simultaneously developed across distant genres of music.

On the one hand, spectral and electronic exploration of sound acted as a sort of springboard for the development of new musical styles, namely in the electroacoustic music (Griffiths 2010). On the other hand, during the 80s' (and 90s') we witness an on-going process of constant and discrete refinements of many genres of popular and alternative music towards more advanced and sophisticated forms, e.g. noise, industrial, IDM2 among others (Cox and Warner 2007; Solomos 2013). Nowadays, the two sides of this musical scenario proceed differently achieving comparable results and a shared desire Ito] create works that seek to engage the listener in a stimulating listening experience' (Weale 2005: 30).

Nevertheless a cross-genre outlook able to recognize and analyse analogous models among compositions coming from unrelated musical fields is currently a hot topic among scholars (Emmerson and Landy 2012).<sup>24</sup> This paper would contribute to this subject developing a new strategy to approach such a diverse musical material in order to recognize similar musical elements, parallel uses and analogous practices among different genres of today's music.

### Area of Research and Methodology

Today, the term electroacoustic is a flexible designation that could embrace an immense area of musical styles (Landy 2007: 12-14): EARS (http://www.ears.dmu.ac.uk/), for instance, lists 81 genres and categories of electroacoustic music.

I confine the examination to the field of music that approaches to sound as a 'sculptural' and complex material to handle, reflecting on it as a dense and tangible entity. This comprehensive description continues to be fairly generic and vague but allows going beyond electroacoustic music definition as a formal combination of acoustic and electrical sounds. The attention of this paper is drawn to identify similar perspectives and outcomes of different musical proceedings, thus including electroacoustic, acoustic or pure-electronic practices.

On the one hand, composers like G. F. Haas, F. Romitelli and B. Lang have advanced their research, each one in his own method, continuing to approach sound as a complex substance to handle. On the other hand, post-minimalists and electronic performers, such as A. Lucier, E. Radigue, coming from the exploratory school of Cage and Schaeffer, have made free use of these musical theories, combining them into more instinctive works.

In this cross-genre area, it is possible to distinguish different perceptions of sound: as a physical phenomenon, (e.g. audio-acoustic experiments, sound installations, A. Lucier, J. Kirkegaard); an object (e.g. M. Chion); an entity (e.g. G. F. Haas); an image (e.g. F. Bayle); a corporeal event (e.g. P. Niblock, PanSonic); an absolute perception (e.g. sound art); an extreme result of a technological atomization process (e.g. R. Ikeda, B. Truax).

The following pieces have been analysed:

- G. F. Haas (String Quartet no.2, In Vain);
- B. Lang (*Differenz/Wiederholung series*);
- R. Nova (*Eleven*);
- G. Verrando (Dune Griet, Triptych2);
- Pan Sonic (Kesto);
- R. Ikeda (+/-);
- Raime (Quarter Turns Over A Living Line, Hennail).

In order to analyse a heterogeneous material, this study focused on the cardinal components of the pieces, following a step-by-step analytic procedure:

- 1. Each composition is divided in musical events (e.g. in a narrative or a musical texture partitioning) (Giomi and Ligabue 1998, Roy 2003, 149-152);
- 2. These events are described as a cross-combination of the four factors: time, dynamics, spectrum and mode.
- 3. Each event has various effects based on space, sound's characteristics and repetition/difference practices (Table 1).

<sup>&</sup>lt;sup>24</sup>e.g. the collaboration of R. Sakamoto and Alva Noto with Ensemble Moderne; Berhard Lang and Philip Jeck; or R. Nova, A. Ingolfsson, Y. Maresz, G. Verrando and PanSonic both with AlterEgo ensemble; the work of Zeitkratzer and Ictus Ensembles; and the London Festival (http://lcmf.co.uld), see also (Emmerson 2007: 64 footnote 8).

#### 3.4. RICCARDO WANKE

This taxonomy aims to simplify the recognition of similar units within our selection.

|             | Factors of   | Effects on  |
|-------------|--|---|
| $_{ m its}$ | <b>Time</b> (e.g.pulse,decay,waves.                            | Spatial Aspects (e.g. expansion/contraction, filling/re-  |
| Eve         | layers   | moval, layering/uniqueness)   |
| Musica]     | <b>Dynamics</b> (e.g. crescendo, con-<br>trast, distortions)   | <b>Spectral characteristics</b> (e.g. climax/anti-climax, approaching/leaving, enlarge/reduce, chatty/solo) |
|             | <b>Spectrum</b> (e.g. acoustic, electronic, real-world sounds) | <b>Repetition/difference aspects</b> (e.g. single/continuum, excess/minimal fact, rhythm, trance)           |
|             | <b>Mode</b> (e.g. acousmatic, multi-<br>channel)               |   |

A complete examination reveals many musical practices with similar qualities and comparable effects within the selected compositions. These correspondences led to the identification of the nine musical attributes that are nearly common to all pieces. These are:

- Expanded Spectrum, i.e. the use of extended frequency range, this trait is more evident for electronic or electroacoustic pieces;
- Microtonal Variations, i.e. the use of microtonality or more in general closed frequency interactions;
- Systematic Glissandi, i.e. the use of glissando embedded into the repetitive units;
- Rhythmic Developments, they are usually integral parts of glitch or techno genres, but occasionally appear in minimal evolution of other contemporary pieces;
- <u>Static Drones</u>, they are normally constituted by layers of sounds, but could exist in continuous stationary orchestration, e.g. Lang or Haas' pieces;
- <u>Repetitive Clusters</u>, i.e. unvaried musical motifs that could generate rhythmic patterns or/and hypnotic effects of mechanical and automated profiles;
- Dynamic Contrasts, they are usually related with the sculptural use of sounds, their combination and the succession of events in repetition or difference;
- <u>Hypnotic Reiterations</u>, they are generated by repetitive musical elements both for static and rhythmic purposes;
- <u>Sculptural Arrangement of Sound</u>, i.e. the use of a defined organization of sounds based on their different nature, background and foreground sounds are a simple case.

In some pieces these designations are frequently combined, e.g. glitch- electronic music usually exhibits repetitive clusters within rhythmic frameworks, while the use of repetition in Lang and Haas' pieces could at times be associated to non-rhythmic hypnotic reiterations or to more complex structures.

For instance, a representative case such as "harsh interventions scattered into continuous layers of sound" consists on the superimposition of musical elements (i.e. mode factor, Table 1) of different type (i.e. time and spectrum factors) and opposite impact (i.e. dynamic factor) and reveal the following attributes:

- Expanded Spectrum
- Static Drones
- Dynamic Contrasts
- Sculptural Arrangement of Sound

More generally, written contemporary compositions (i.e. Haas and Lang's pieces) make elaborated use of simple musical elements to create new effects. On the other hand, electronic pieces apply drastic timbric solutions providing analogous results. There are evident parallels within our selection, when static musical episodes are examined or even when electronic devices are used in written compositions.

Considering the global results, each work has in common with the others at least eight out of nine attributes. Therefore, even if these traits are pretty general, their concomitant fulfilment allow the definition of a clear frame of reference that validates our premises. In this manner, these nine musical features represent a description of a common cross-genres perspective.

One could argue that this selection of pieces includes borderline examples that facilitate the comparison. However, this cross-genres examination is innovative, therefore it appears important to start with a solid musical platform that offers clear models of a shared outlook.

#### Conclusions

This paper proposes a new method to look over different genres of music. It focuses on aural characteristics and effects of primal musical elements, thus enabling the comparison of various typologies of composition (e.g. traditional instrumental piece, electroacoustic composed work or improvised electronic session). In this way, nine musical attributes are identified within the selection of pieces. These attributes relate to specific uses of sound material and reveal correspondences among distant compositions.

In the future, it is planned to apply this method toward a more comprehensive list of pieces and I intend to extend the investigation using these nine indicators within listening sessions with questionnaires and interviews to expand the designation of this cross-genres perspective toward perceptual aspects. Thereby, a better understanding of specific fields of music would be developed, facilitating artistic convergences and the creation of a didactic and academic platform for the study of diverse musical contexts.

#### References

Bériachvili, George. 2008. "La Poetique Du Son Dans L'oeuvre de Giacinto Scelsi." In *Giacinto Scelsi Aujourd'hui*, 201-19. Paris: Publication Cdmc.

Cox, Christoph, and Daniel Warner, eds. 2007. Audio Culture. Readings in Modern Music. New York: Bloomsbury.

Emmerson, S. 2007. Living Electronic Music. Aldershot, U.K.: Ashgate.

Emmerson, S. and L. Landy. 2012. The Analysis of Electroacoustic Music, the Differing Needs of Its Genres and Categories. In *Proceedings of the Electroacoustic Music Studies Network Conference Meaning and Meaningfulness in Electroacoustic Music*. Stockholm: EMS 12. http://www.ems-network.org/IMG/pdf\_EMS12\_emmerson\_landy.pdf

Giomi, F. and M. Ligabue. 1998. Evangelisti's Composition Incontri Di FasceSonore at W.D.R.: Aesthesic-Cognitive Analysis in Theory and. *Journal of New Music Research* 27 (1-2): 120-45.

Griffiths, Paul. 2010. Modern Music And After. 3rd Edition. New York: Oxford University Press.

Landy, Leigh. 2007. Understanding the Art of Sound Organization. Cambridge, Mass.: MIT Press.

Roy, Stephane. 2003. L'analyse Des Musiques Électroacoustiques : Modèles et Propositions. Paris: L'Harmattan. Solomos, Makis. 2013. De La Musique Au Son. L'émergence Du Son Dans La Musique Des XXe-XXIe Siècles. Colletion Aesthetica. Rennes: Presse Universitaires de Rennes.

Weale, R. 2005. The Intention/Reception Project: Investigating The Relationship Between Composer Intention And Listener Response In Electroacoustic Compositions. PhD Thesis. De Montfort University.

#### 3.4.2 Riccardo D. Wanke

Riccardo D. Wanke (Genova, IT), from 1995 active in arts (music, installations) and science (academic studies in radical chemistry), his interest includes improvised and exploratory music and it is focused on diffusion of new and contemporary art. He is particularly interested in digital and analog manipulation of sound and its application into musical compositions. From 2013, he is PhD student in Musicology and member of CESEM (Centre of aesthetic and sociological musical studies) at the University "Nova" of Lisbon. Where he is investigating the definition of a cross-genres perspective to analyse unrelated styles of today's music.

From 2011, he is founder of the Cultural Association "Mazagran" and Editor of a music label to design and produce highly selected art-musical editions. He is active as composers and performer (piano, saxophone, guitars and electronics). He performed live worldwide (Portugal, France, Germany, Spain, Mexico, Italy, among others) as a solo and in various ensembles. His music is published on several international labels (USA, PT, CH, IT). http://rdwmusic.com and http://orcid.org/0000-0002-5480-7905

# 3.5 Olaf Hochherz

### 3.5.1 What do we use when we use electronic instruments?

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The instrument as a object of interest is explicitly acknowledged, in the discourse of historically informed performance practice (Butt 2002), discussions pertaining to the influence of recording technologies on musical styles (A. Bennett and Dawe 2001) and musical instrument design (Weium and Boon 2013), and analyzes of musical performance practices (Rink 1995). While these discussions focus on the position of the instrument in a network of influences I like to focus today on their status as objects. This might appear as a rather narrow point of view as it is obvious that a musical instrument has its specificity in its use in musical performance practice (Dawe in Clayton et al. 2012). But to describe their role in this practices it is helpful to look how their materiality introduce constrains, which are than conceptualized by the musician. The materiality of the instrument, which is obvious for traditional instruments as they are clearly defined objects, is rather ambiguous for electronic and digital instruments.

Because of this ambiguity it is a matter of discussion, if for example rather dynamic software sound synthesis environments like SuperCollider, should be described as musical instruments. While the underlying ideas of electronic and digital sound synthesis are well discussed (Puckette 2007) are electronic instruments primarily discussed in following the history of their development and the biography of the musicians using them (Holmes 2002; Manning 2004). The challenges electronic instrument introduce to the concept of musical instrument have been discussed from its beginning sometimes with the conclusion that the term seems to be inappropriate (Meyer-Eppler 1953).

There are two ways in which the musical instrument as a distinct object is ambiguous. First acoustic instruments can be described with material-acoustics; all their material appearance influences their sound. Electronic instruments are structured by the circuits, which allow them to be shaped in various ways. Digital instruments finally work upon the generalization of these electronic circuits in computers, which allows the same physical device to hold a vast variety of possible instruments. Second some instruments like organs, keyboards or flutes often have a rather clear defined shape and standardized interface. While other instrument are rather modular. The rock and jazz drum- set played with various sticks can be seen as such a middle case. The modular analog synthesizer is explicitly modular connecting clearly defined objects. On the opposite end to an organ we can see software sound synthesis environments, which can be conceptualized as a fluid, where arrays of samples function as its molecules. From the musicians point of few this differences are obvious, but also closely linked to their particular practice.

I do not aim to create a categorization of the materiality of musical instruments, but to look how the different conceptions musicians have of their instruments as objects can be reflected through the in discussions about the ontological status of objects in as their appeared under the label of new materialism (Latour 1999, 2005; Harman 2005, 2002; Bryant 2014, 2010; De Landa 2006; Barad 1998; Bogost 2012; J. Bennett 2010). These discussions have found big resonance in theories of art and culture and are now starting to be reflected in the field of musicology (Frasch; Wong 2012) and sound studies (Pinch 2008) and organology (Bates 2012; Roda 2014). In my presentation I do not aim to discuss the ontological status of electronic instruments as objects but how the previously mentioned discussions can inform the descriptions ob electronic instruments. I look how an

instrument is constituted as an object of a particular consistency by the musicians practice and how this links to conceptions of the object.

#### References

Barad, Karen. 1998. "Getting Real: Technoscientific Practices and the Materialization of Reality." *DIFFERENCES-BLOOMINGTON*- 10: 87–126.

Bates, Eliot. 2012. "The Social Life of Musical Instruments." *Ethnomusicology* 56 (3): 363-95. Bennett, Andy, and Kevin Dawe, eds. 2001. *Guitar Cultures*. http://libweb.cityu.edu.hk/cgi-bin/er/db/netlib.pl? 74439.

Bennett, Jane. 2010. Vibrant Matter: A Political Ecology of Things. Durham: Duke University Press. Bogost, Ian. 2012. Alien Phenomenology, Or, What It's like to Be a Thing. Posthumanities 20. Minneapolis: University of Minnesota Press.

Bryant, Levi R. 2010. The Democracy of Objects. http://hdl.handle.net/2027/spo.9750134.0001.001. Bryant, Levi R. 2014. Onto-Cartography: An Ontology of Machines and Media. Speculative Realism. Edinburgh: Edinburgh University Press.

Butt, John. 2002. Playing with History: The Historical Approach to Musical Performance. Cambridge University Press.

Clayton, Martin, Trevor Herbert, and Richard Middleton. 2012. The Cultural Study of Music: A Critical Introduction. 2 edition. New York: Routledge.

De Landa, Manuel. 2006. A New Philosophy of Society: Assemblage Theory and Social Complexity. London; New York: Continuum.

Frasch, Heather. "In the Work of Hanna Hartman."

Harman, Graham. 2002. Tool-Being: Heidegger and the Metaphysics of Objects. Chicago: Open Court.

Harman, Graham. 2005. *Guerrilla Metaphysics: Phenomenology and the Carpentry of Things*. Chicago: Open Court.

Holmes, Thomas B. 2002. "Electronic and Experimental Music - Pioneers in Technology and Composition." *EBSCOhost. eBook Collection*. http://libweb.cityu.edu.hk/cgi-bin/er/db/netlib.pl?102656.

Latour, Bruno. 1999. Pandora's Hope: Essays on the Reality of Science Studies. Cambridge, Mass: Harvard University Press.

Latour, Bruno. 2005. Rassembling the Social: An Introduction to Actor-Netowork-Theory. Clarendon Lectures in Management Studies. Oxford; New York: Oxford University Press.

Manning, Peter. 2004. "Electronic and Computer Music." *Ebrary*. http://libweb.cityu.edu.hk/cgi-bin/er/db/ebrarybk.pl?10086944.

Meyer-Eppler, Werner. 1953. "Elektronische Kompositionstechnik." Melos 20 (1): 5-9.

Pinch, Trevor. 2008. "Technology and Institutions: Living in a Material World." *Theory and Society* 37 (5): 461–83. doi:10.1007/s11186-008-9069-x.

Puckette, Miller. 2007. The Theory and Technique of Electronic Music. Singapore; Hackensack, NJ: World Scientific Publishing Co.

Rink, John, ed. 1995. The Practice of Performance: Studies in Musical Interpretation. Cambridge [England]: Cambridge University Press.

Roda, P Allen. 2014. "Tabla Tuning on the Workshop Stage: Toward a Materialist Musical Ethnography." In , 23:360–82. Taylor and Francis.

Weium, Frode, and Tim Boon, eds. 2013. *Material Culture and Electronic Sound*. Artefacts: Studies in the History of Science and Technology, v.8. Washington, D.C.: Lanham, Md: Smithsonian Institution Scholarly Press; Rowman and Littlefield.

Wong, Mandy Suzanne. 2012. "Sound Objects: Speculative Perspectives."

## 3.5.2 Olaf Hochherz

Olaf Hochherz is a sound artist and researcher mostly performing with self build electronic instruments and computer programs. He develops installations and performance installations. His interest is in the conjunction of the instability, self-generation, and associative capacity of sounds.

#### 3.6. ALEJANDRO ALBORNOZ

He presented his electronic compositions at different Festivals. His installations could be realized in Germany, Taiwan and China. He toured with his performances throughout Central Europe and East Asia.

He got educated at Folkwang Hochschule Essen in electronic composition, Humbold University Berlin in philosophy and computer science and at Bauhaus University Weimar in sound-art/media-art. He holds a BFA and MFA in Mediengestaltung (Media-Art).

His research interests lie in the impact of technologies on artistic practices, his research is about how technologies changed the meaning of imitation in music and sound-art.

## 3.6 Alejandro Albornoz

## 3.6.1 Computer Music in Chile: The Beginning and some paths to the future: An historical review

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In the early 70s a small group of people started the computer music activity in Chile. Among these group of professionals and students, there is a remarkable figure: José Vicente Asuar, composer and engineer, pioneer of electroacoustic music in Latin America. This beginning is well documented, although its position within the corresponding historical framework has not an adecuate correlation and there is no a proper theoretical connection with the related works in the next decades, either at Chile and the region or within a global context as well. This paper intends to give a brief review, and as comprehensive as possible, of the historical events involved within this starting point of computer music in Chile. Among these events there are the first explorations in computer assited composition by means of algorithmic procedures, the use of a computer to control analog synthesizers and theoretical texts on these explorations. This little history, small because has few protagonists and occurs in few years, has a leading character in the figure of Asuar, whose relevant technical work, music and thinking is examinated in order to trace paths and prospect links in the future generations. Virtually all the mentioned activities were generated by Asuar, whom carried out diffusion through the realease of two LP's. Important is the vanguardistic interdisciplinary work that leads to these works of engineering and art, activity accomplished within the Universidad de Chile.

Nevertheless, there is one more achievement by Asuar, maybe the most significant: the creation of an original computer for only one purpose, that is the creation and performing of music. This computer, the COMDASUAR (Asuar Digital-Analogic Computer) created in the late 70s, had several interesting features as being unique at its moment and combine digital and analogic technology in one equipment. This article shows the general structure of this machine, its synthesis engine and its tools for assisted composition as well, highlighting the combination of a quartz digital oscillator and filtering analogic devices, capability for programming western tempered music, microtonal music or other types, serial techniques and aleatoric procedures named by the author as "heuristic".

At the same time, this text addresses significant milestones of the history of informatics in Chile, specially focusing from 1961 to the 80s, period that is the conceptual and technical soil where computer music establishes their foundations. This period marks the arrive of the first digital computer to Chile in 1961 and the social and political evolution of the country through the use of computers within the socialist project of Salvador Allende at early 70s and the neoliberal economic system implanted by the militar dictatorship from 1973 onwards. The use of informatics in different areas such economics, scientific research or in one hand the violation of human rights and in the other hand the the protection of these rights, are the constitutive elements that gives the conceptual framework for the artistic works with computers in Chile.

So, this amalgam will cause, at first, a specificity that confine this knowledge in specialized centers within the academic, state and industrial scopes. The lack of others researchers in this confluence area between art and technology, will cause a gap very notorious if we compare the development on this field in a country like Chile and the main centers of technological and industrial progress located in Europe and North America. After the entry of the first digital machines at the 60s, the consolidation until the 80s, passing through the socialist experience of the network project by Stafford Beer during the Salvador Allende's government in the early 70s, it will come the expansion of computing during the growth of the neoliberal economic system by the middle of the 80s. Through this evolution, the achievements by Asuar were forgotten and only viewed with atention abroad within the international electroacoustic community. Moreover, based in Barcelona, the prominent chilean electroacoustic composer Gabriel Brnčić put his own algorithm in a colaborative work which reached an state of consolidation with his software "Ronde-Bosse" for assited compostion at the early 2000s. Besides this experience, only with the arising of the personal computer alongside the new impulse and the opening of electroacoustic music to new generations due to this technological massification phenomena, a group of researchers, artists and composers will trace a genealogical path between the contemporary chilean computer music and the pioneering realizations by Asuar and conections with Brnčić's artistic, technical and pedagogic work.

Finally this paper covers the essential ideas within the "Ronde-Bosse" and the theoretical corpus on the use of technology in music by Brnčić. At the same time, this article completes the panorama of computer music in Chile making a review of the actual state of the art of the Chilean composers that use computers in music, either for acousmatic, mixed or instrumental creations.

#### Bibliography

Álvarez, Juan and Claudio Gutiérrez. *History of Computing in Chile, 1961-1982: Early Years. Consolidation, and Expansion.* IEEE Computer Society, Annals of History of Computing, 2012.

Asuar, José Vicente. Música con computadores: Cómo hacerlo..? (Music with computers: How to do it..?). Revista Musical Chilena: XXX, no. 118 (April-June). Chile: 36-66. 1972a.

Asuar, José Vicente. Recuerdos (Memories). Revista Musical Chilena: XXIX, no. 132 (October-December). Chile: 5-22. 1975.

Asuar, José Vicente. Un sistema para hacer música con un microcomputador (A music-making system using a microcoputer). Revista Musical Chilena: XXXIV, no. 151 (July-September). Chile: 5-28, 1980.

Herrera, Silva. Gabriel Brncic. Un primer acercamiento hacia el compositor y maestro chileno en el exilio. Revista Musical Chilena, LIX, no. 204 (July-December). Chile: 26-59. 2005.

Hinojosa Chapel, Rubén. *Realtime Algorithmic Music Systems From Fractals and Chaotic Functions: Toward an Active Musical Instrument*. Thesis Submitted in partial fulfilment of the requeriments for the degree of Diploma of Advanced Studies Doctorate in Computer Science and Digital Communication Department of Technology. Tutor: Dr. Francesc Xavier Serra Casals. Universitat Pompeu Fabra, Barcelona, September 2003.

Medina, Eden. The State Machine: Politics, Ideology, and Computation in Chile, 1964-1973. PhD Thesis, Massachusetts Institute of Technology, 2005. Accessible at: http://dspace.mit.edu/handle/1721.1/39176 Medina, Eden. Revolucionarios Cibérneticos: Tecnología y política en el Chile de de Salvador Allende. Santiago de Chile: Ed. LOM, First edition, 2013.

Schumacher, Federico. *Historia de la Música Electroacústica en Chile (History of Chilean Electroacoustic Music)*. Free PDF. Chile, 2005. Accessible at: https://universityofmontreal.academia.edu/FedericoSchumacherRatti

#### 3.6.2 Alejandro Albornoz

Alejandro Albornoz is a composer, sound and visual artist. He studied electroacoustic composition with Rodrigo Sigal and Federico Schumacher and works on acousmatic and live electronics since 2004. His music has been performed in several and prestigious festivals like Synthèse (Bourges, France), JIEM (Madrid), Bienal Internacional de Música Eletroacústica (São Paulo) and Sonoimágenes (Buenos Aires). He is an active member of the Electroacoustic Music Community of Chile (http://www.cech.cl) and of the Latinamerican Sound Art Network (www.redasla.org). Usually he composes for theatre and dance. He has been producer of several concerts, meetings, conferences and publications, highlighting the International Festival of Electroacoustic Music of Chile "Ai-maako" and CD collections of Chilean electroacoustic music. Since February he is a PhD researcher on Electroacoustic Composition at the Departement of Music in the University of Sheffield. http://www.soundcloud.com/mankacen

# 3.7 James Andean

## 3.7.1 Rhythm in Acousmatic Music

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Acousmatic music is not generally considered to be a particularly 'rhythmic' form of music. In fact, quite the opposite: much acousmatic music generally avoids established rhythm, pulse or beat, in much the same way that it often eschews open melodic or, especially, harmonic structures. To what extent, varies significantly between composers and works; however, it is fair to say that, as a general rule, acousmatic music employs a sufficient degree of abstraction with regards to more 'traditional' musical parameters, rhythm included, to make it an unlikely subject for a discussion of rhythm.

We will propose here, however, that despite the initial appearance of a lack of rhythm, acousmatic music does indeed contain rhythmic qualities, and that, in fact, rhythm is one of the dominating forces of acousmatic music.

The general attitude to rhythm across *musique concrète* and acousmatic music is one that is shared across much of electroacoustic practice, and indeed much of contemporary music more generally: a general sense of abstraction with regards to the more regimented, grid-like structures of traditional tonal music. 'Rhythm' is often equated with 'metered pulse'; as the latter is often eschewed by contemporary music, including acousmatic music, this is often assumed to mean an absence of rhythm. This is, however, critically and categorically false: there are many other very significant aspects of rhythm, beyond the simple quality of metre, and these aspects are often central to much contemporary music, and certainly to acousmatic music. To turn to Stockhausen: "Although many of the new compositions have been criticized for their alleged 'lack of rhythm', they may actually be considered to have 'pure rhythm' without meter." (Stockhausen 1962: 43) While we will not attempt to address the relative 'purity' of unmetered rhythm, we will argue that our reception of such rhythm is key to our experience of acousmatic music.

The most important key to acoust rhythm, however, does not lie here, in the fluid temporal attitudes to rhythm employed in some areas of contemporary instrumental musical; it lies, rather, as with much of acoustic philosophy, in the rhythmic qualities of the world around us — or, perhaps more accurately, in our perception of the world around us.

Acousmatic composers have likely all had the experience of moving sonic materials around on a timeline in order to arrange them into sound objects or into longer phrases, only to find that, despite our firm compositional conviction that these materials are well suited to join together to form a compound unit, they are instead stubbornly refusing to fuse, to lose their discrete identities and become one. We might also recognise the related experience of placing phrases in a formal sequence, seeking the appropriate placements and spaces between that will make it all seem natural, only to find that these magical placements and relationship are proving furtive or elusive. In many of these cases, when the materials finally do lock together, or when the perfect durations of pauses between phrases are found, it is often extremely small differences in placement or duration that make the difference between a haphazard collection of sonic scraps, and a gracefully and invisibly fused gesture or phrase, or a graceful ballet from phrase to phrase.

The source of this almost mystical fusion, so painfully elusive at times, is compound, and therefore difficult to pin down with any degree of objectivity. In broad terms, it seems to be the result of a combination of two elements: our embodied sense of real-world gesture, and our culturally-learned sense of rhythm. If either of these is contradicted by the placements and timings of the sound object, gesture, phrase, or formal section we are attempting to craft, then these elements refuse to 'come together'; when, at last, the elements align with our senses of rhythm and of embodied gesture, then they suddenly appear 'natural' and 'right', and all previous tensions between said materials tend to vanish. David Huron ascribes this to the relative degree of predictability in the timing of the event, a quality that may well be a question of musical rhythm, but may also be a question of embodiment, or, indeed, of anything that grants us a particular expectation based on familiarity (Huron 2008: 177-199).

Very importantly, however, it could be argued that 'embodied gesture' and 'musical rhythm' are not, in fact, two distinct qualities, but rather are two sides of exactly the same coin. For example, we might turn to the range of time scales in music proposed by Curtis Roads, beginning with the broadest scale (at its most extreme), and zooming increasingly closer, to arrive at the smallest subdivisions: 1) Infinite; 2) Supra; 3) Macro; 4) Meso; 5) Sound Object; 6) Micro; 7) Sample; 8) Subsample; 9) Infinitesimal (Roads 2001: 3-4). It could be argued that 'gesture' and what is normally referred to as 'rhythm' are simply different steps in Roads' categorization above — for example, we might equate 'rhythm' with Roads' 'Micro' level, and 'gesture' with Roads' 'Meso' level.

More importantly, however, research and theory in a number of fields — such as ecological psychology (Clarke 2005, Windsor 1995) and music cognition (Huron 2008) — suggest that musical notions such as 'rhythm' are, in fact, simply cultural expressions of our embodied experience of ourselves and of the world, rooted in primal and innately 'rhythmical' bodily acts such as walking, breathing, our heartbeat, etc. R. Murray Schafer (1977) extends this intuitive sense of rhythm out into the soundscape, linking our concept of musical rhythm to both our biological rhythms of heartbeat and footstep and the diurnal rhythms of the ecosystem. Gilles Gobeil echoes and extends this somewhat, to propose that the world itself is inherently rhythmical, with sounding events aligned or in rhythmical correspondence to an alarming degree. (Gobeil, personal correspondence) For Gobeil, acousmatic music is rhythmic in nature because the world is rhythmic in nature, a sentiment which echoes Schaeffer's foundational phenomenology, but with a somewhat Platonic twist where Gobeil posits accusmatic composition as an aesthetic shadow or reflection of the world itself. An interesting expression of Gobeil's attitude towards acousmatic rhythm is his tendency to 'conduct' during acousmatic listening, including works that contain no immediately recognisable traces of metre, period, or other obviously 'rhythmical' properties. It is remarkable to observe the degree and precision to which Gobeil is able to immediately, almost intuitively, identify with astonishing accuracy underlying rhythmical organisations which remained completely invisible to other listeners, including the composers themselves.

To some extent, these rhythmic qualities of the world described by Gobeil and Schafer may rather be a question of our perception and our cognition being rhythmically 'primed': that we are tuned to scan the world for rhythmical qualities, possibly due to qualities of human speech and other forms of communication, or simply as a consequence of pattern-seeking (Berlyne 1971, Thaut 2005). On the other hand, it is possible that it is not only that we are looking for rhythm, but that our perceptual means are themselves inherently rhythmical, and that as a result all information coming in is filtered through and charged with this inherent rhythmical quality. In other words, the fact that we find rhythm everywhere is perhaps not so much a characteristic of our environment, but rather a consequence of rhythmical characteristics of our means of perception. (Mauro 2006)

In addition to the perspectives above, this paper will consider the works of several composers and theorists as case studies, and will further argue that canonical approaches to rhythm in western music, for example Lerdahl and Jackendoff (1983), are perhaps not as incompatible with acousmatic music as might first appear.

#### References

Berlyne, D.E. 1971. Aesthetics and Psychobiology. New York: Appleton-Century-Crofts.
Clarke, E. (2005). Ways of Listening: An Ecological Approach to the Perception of Musical Meaning. New York: Oxford University Press.
Huron, D. 2008. Sweet Anticipation: Music and the Psychology of Expectation. Cambridge: MIT Press.

Lerdahl, F. and R. Jackendoff. 1983. A Generative Theory of Tonal Music. Cambridge: MIT Press. Mauro, D. 2006. The Rhythmic Brain. CogSci/ICCS 2006 Proceedings. http://csjarchive.cogsci.rpi.

edu/proceedings/2006/iccs/p163.pdf

Roads, C. 2001. Microsound. Cambridge: MIT Press.

Schafer, R.M. 1977. The Soundscape: Our Sonic Environment and the Tuning of the World. Rochester: Destiny Books.

Stockhausen, K. 1962. The Concept of Unity in Electronic Music. *Perspectives of New Music* 1(1): 39-48. Thaut, M.H. 2005. *Rhythm, Music, and the Brain: Scientific Foundations and Clinical Applications*. New York: Routledge.

Windsor, W.L. 1995. A Perceptual Approach to the Description and Analysis of Acousmatic Music. City University: Unpublished doctoral dissertation.

#### 3.7.2 James Andean

James Andean is a musician and sound artist. He is active as both a composer and a performer in a range of fields, including electroacoustic composition and performance, improvisation, sound installation, and sound recording. He is a founding member of improvisation and new music quartet Rank Ensemble, and one half of audiovisual performance art duo Plucie/DesAndes. He has performed throughout Europe and North America, and his works have been presented around the world. He is a lecturer at the Centre for Music and Technology of the Sibelius Academy/University of the Arts Helsinki.

# 3.8 Simon Emmerson

### 3.8.1 How we describe what we experience in electroacoustic music

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In a recent chapter (entitled 'Feeling Sound') for a volume for the Peeters/Leuven Studies in Musicology (Music Analysis and the Body: Experiments, Explorations and Embodiments — forthcoming 2015) the aim was in the first instance to suggest a discourse of experience of electroacoustic sound from the listener's point of view. I decided to confine this initial exploration to the strong role that memory has in influencing our listening habits. In that chapter I have attempted to describe from memory some of my earliest experiences of electroacoustic sound in performance. Amongst others I examined there my reactions to performances of Roger Smalley's Pulses (brass, percussion, live electronics), performed by the London Sinfonietta in 1968, the Stockhausen ensemble concerts at St. Johns, Smith Square, London in 1972, and a private and first UK public performance of Denis Smalley's Pentes, in York in 1974-76. Using an autoethnographic approach does not suggest (I hope) a purely personal language, isolated and unshared. We seem to lack a desire to discuss the essentially personal experiences of such music (and sound) — but this may be because we have no given vocabulary and have gained a self-conscious desire not to commit (either way!). This project aims first to allow metaphorical descriptions that may liberate this discourse — what does it sound like? (The English language is ambiguous here — I do not just mean responses such as 'it sounds like a helicopter' but further descriptions of behaviour and change.) And what does this make you feel? Tonal music (both classical and popular) has developed vocabularies that are rarely applied in this field and seem not to be entirely appropriate.

This paper will need to summarise very briefly this chapter (not yet available) but will rapidly move on to a 'mirror' discussion. I would suggest these first experiences described above lie within about a 20-30 year period of electroacoustic music and sound performance (ca. 1950-1970s) where the loudspeaker remained a more or less 'special' object — fixed usually to a specific location and specially installed in studios and concert halls for performance. With the 'invasion' of the transistor radio from the late 1960s and the launch of the Sony Walkman in the late 1970s we have had the steady establishment of the 'ubiquitous loudspeaker', capable of being continuously with us wherever and whenever we want (and often when we do not). The emergence of integrated smart technologies in the years since 2000 has completed this first phase of ubiquitous sound.

In parallel the kind of sound we hear around us has changed: films, computer games, advertising, and feedback from music and sound art itself, have all had a profound effect on everyday listening. The sounds used in today's 'alerts' - sound semiotics at its simplest and most effective - are now clearly and (in the proper sense of the term) indiscriminately electro-acoustic - with the hyphen. In public transport today, I may hear a pseudo-marimba (probably synthesized — but I'll never know), an unbelievable realistic ringtone of the 1970s, an electronic bleep that reminds me (though probably not its owner) of R2D2 in Star Wars (itself a reference to such as Ligeti's Artikulation). Thus source/cause chains — a staple of much discussion on liveness in our field over the years — are decisively problematized (perhaps made irrelevant in their original form). So a new approach to describing our responses to electroacoustic sound may need to be found — I have written previously on how electronic sound may articulate new areas of 'indicative field' (after Smalley).

be multidimensional and importantly refer to other electroacoustic sources (we have tended to stick to rather simple live/synthesized dualities to date). Thus references and potential meanings are generated through a genealogy of origins, maybe over several generations. (Ethnomusicologists and some historical musicologists are well used to this way of linking evidence together.)

But that was a necessary digression from the main thrust of this proposal: the need to encourage, refine and develop shared languages of response to the music and sound art heard through loudspeakers. Without this, meaning in electroacoustic music will be confined to a kind of one-dimensional black and white description of shape and tone, where we crave the additional dimensions of depth, dynamic and colour. Worse still we would be in danger of declining to the monosyllabic responses of the social media ('like').

There is an assumption in my idealized view that needs discussion. Different listeners have sometimes very different views on how 'experience' and 'reflection' are best related - that is if we are truly 'into' the music we are (perhaps) in a non-verbal place that should not be invaded! Academics too easily fail this test and forget this possibility. This is non-trivial — 'reflection during' and 'reflection after' the musical experience engage different orders of memory, and the fleeting may have evaporated. A repeated listening may be in a different social situation and profoundly change the response. While fashionable in so many fields at the time of writing, 'mindful' listening has always been what many musicians practice! What is the balance of this 'transcendental' suspension and the world of the tweet while listening?

Such issues are true for all kinds of musical experience, but for this paper I shall compare a range of key listening environments with respect to our relationship to the loudspeaker and the specifically electroacoustic experience: [1] concert hall (a) accusmatic sound alone, (b) audio-visual work; [2] installation (a) fixed media, (b) interactive; [3] outdoor presentation; [4] personal focused listening (a) public space, (b) private space. Using specific examples and sites, I shall explore the value of reflection and the need to develop further vocabularies of reflection. Languages are in continuous evolution as technology and society change — as reflected in the 45 years referred to in this paper. We need to move from the special to the general theory of loudspeaker listening.

#### 3.8.2 Simon Emmerson

Simon Emmerson is Professor of Music, Technology and Innovation at De Montfort University, Leicester. As a composer he works mostly with live electronics, recently Sond'Arte (Lisbon) and an acousmatic work for Inventionen Festival (Berlin). He contributed to and edited The Language of Electroacoustic Music (Macmillan, 1986) and Music, Electronic Media and Culture (Ashgate, 2000). His book Living Electronic Music was published by Ashgate in 2007. In 2009-2010 he was DAAD Edgar Varèse Visiting Professor at the TU, Berlin. In 2011 he gave the keynote addresses at the Australasian CMC (Auckland) and ICMC (Huddersfield), and in 2012 in São Paulo and Taiwan, and in 2014 at Audiomostly (Aalborg).

## 3.9 Andrea Szigetvári

## 3.9.1 SLApps Sonic Learning Applications: systematic exercises for developing listening skills in electroacoustic music

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This article presents the results of a research aiming to develop a series of ear-training exercises for electroacoustic musicians. The 18 month-long project was funded by the Social Renewal Operational Programme of the Government of the Republic of Hungary.

After the sonic revolution in the second half of the  $20^{\text{th}}$  century, a rapid development of the material constituting music took place. A new music "lexicon" has been formed, where the significance of so called primary musical parameters ceased to exist, and timbre became an integral part of the creation of musical form. The timbre of sound became a new form-bearing quality of music. Timbre is nevertheless a substantially more complicated parameter than pitch or rhythm since it is multidimensional and has an indefinable – theoretically infinite – range. Its methods of organization cannot be described by the rules of traditional music theory. Along

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with the expansion of the electroacoustic music repertoire, many contributions have been made to form its own theory. In the process of the development (and later in the process of the application) of a new music theory, it is indispensable to rely on common listening experiences collected and shared by the music community. To embrace and describe the newly discovered sonic material, composers and researchers still rely, on the one hand, on Pierre Schaffer's and Denis Smalley's systems of categorization and, on the other hand, technical description of sound synthesis and processing techniques. Reading analyses of electroacoustic music pieces, one can also see different graphic representations of sonorities very often based on sonograms. None of the above mentioned methods allow for univocal description of the basic elements of the sound material used in electroacoustic music compositions. Electroacoustic music is still lacking a standardized system similar to the classical music solfége, where the basic form-bearing qualities - pitch and rhythmic elements - are specified and expected to be recognized by professional musicians. Development of a standardized ear-training system dealing with timbre would help to:

- share the knowledge of realization of synthesized and processed sound objects composers normally acquire empirically,
- extend further the common language for description of sound elements
- understand the possible structuring processes inherent in timbres
- navigate in timbre space

SLApps are developmental series of exercises that enable students to acquire analytical listening skills, remember and understand timbre. SLApps are downloadable standalone programs (built in MAX/MSP) containing practical interactive applications that allow direct learning experience and a possibility to test and assess these newly gained listening skills.

SLApps extend the notion of "ear training" to those qualities of sound that cannot be quantified in terms of pitch and rhythm. The main subject of exploration are the manifold dimensions of timbre space. The practical work of the creation of the exercises was informed by my research on the control of the multidimensional timbre space documented in my DLA dissertation<sup>25</sup>. In my thesis, I introduced the concept of "Reduced Timbre Space". Reduced timbre space consists of a matrix containing a limited amount of sensory dimensions with a limited range. The reduction concerns the number of dimensions, their range, the function of mapping, and the number of discrete steps within the dimensions. The conceptual apparatus of the reduced timbre space is well applicable in practice through the construction of a reduced timbre space. By separating, identifying, and scaling timbre dimensions, sounding materials of varying complexity can be created. Their structure is made visible by structuring and visualizing the parameters of the sound synthesizing and processing techniques.

It was necessary to employ a variety of sound synthesis and processing techniques in order to model timbre dimensions. Whilst different methods of synthesis and processing can create identical "fixed coordinates" within timbre space, the trajectories between "coordinates" are different for each synthesis technique. The choice of a particular method will determine which paths one can follow through multi- dimensional timbre space. For example, modifying brightness with a low-pass filter will affect change on both the "hollow" (clarinet-like sound: realized by adding together odd partials) and the "nasal" (oboe-like: realized by adding together all partials) dimensions. The synthesis techniques used in the exercises include: additive synthesis, FM synthesis, subtractive synthesis, and granular synthesis.

The exercises are devised developmentally, through gradually increasing the number of timbre dimensions and the complexity of tasks over consecutive steps. Initially, students are asked to identify and recognize 5-7 steps along one single timbre dimension. The most complicated exercise in the recent version combines six timbre dimensions containing a matrix of 1800 sounds. The tasks include identifying the dimensions of individual sound objects, identifying envelopes of synthesis and processing parameters influencing timbre dimensions, identifying and recreating timbre motifs (Klangfarben melodies) and recreating timbres themselves.

Some of the more complex SLApps are based on outstanding researches and pieces of electroacoustic music (e.g. works by John Chowning and Jean-Claud Risset).

List of SLApps:

 $<sup>^{25}</sup>$ Szigetvári, A. 2013. "A multidimenzionális hangszíntér vizsgálata" (In Hungarian. Translation of title: Multidimensional Timbre Space) DLA thesis, F. Liszt Academy of Music, Budapest, pp. 220

- 1. changing timbres along the darkness-brightness dimension applying low-pass and high-pass filters
- 2. changing timbres along the noisy-pitched and darkness-brightness dimensions applying band-pass filter with a bandwidth of octave and third
- 3. changing timbres along the dimension of brightness by adding 8 sinewaves
- 4. changing timbres along the brightness, nasal and hollow dimensions in different pitch registers by adding together 48 sinewaves
- 5. changing timbres along the metallic, sharp-soft attack dimensions by FM synthesis
- 6. changing the hardness of the attack and the noisiness of a percussive sound by FM synthesis
- 7. changing the timbre along dimensions of noisiness, sharpness by FM synthesis
- 8. changing the timbre along resonance, noisiness and brightness by additive resonant filter
- 9. changing timbres along the beating-rough-inharmonicity dimension by adding beating sinewaves to the spectrum
- 10. changing the behaviour of grains by granular synthesis
- 11. changing sounds along the dimensions of the speed of granulation and brightness creating interpolating timbres by applying envelopes to the parameters.
- 12. modeling timbres based on Jean-Claud Risset's synthetic bell sound applying six different dimensions

Each SLApp contains demonstrations and tests of different difficulty. The project is a work in progress. The existing SLApps have been tested in education at courses for electroacoustic music composers at the F. Liszt Academy of Music and at Pécs University.

### 3.9.2 Andrea Szigetvári

Andrea Szigetvári is an electroacoustic music composer. Her creative and research interests are timbre in new music, interactive performance, and synchresis in audiovisual art. She studied in Warsaw at the F. Chopin Academy of Music and then as a Fulbright scholar in the USA, returning to Hungary to set up the Hungarian Computer Music Foundation. In addition to composing, she lectures on computer music composition and has organized international new music festivals, conferences and pan-european projects.

## 3.10 Eldad Tsabary

## 3.10.1 Aural atoms and structures in electroacoustics : From ear training to analysis and back again

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Analysis in electroacoustics (Ea) is an aural necessity. We analyze to understand what we hear, but we also need trained ears in order to analyze, because analysis requires detailed content, which in Ea is available mostly in sonic forms. This interdependence of analysis and ear training has been the basis of Ea aural training courses at Concordia University in Montreal, which I have been developing for the past decade. These courses begin with an atomistic approach, which trains students in breaking aural stimuli into the smallest possible

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parts (*aural atoms*) and thus extracting more evidence for analysis from them. Once the students' ears become focused and detailed, the courses proceed with a synergistic analytical approach, aimed at training students to assemble and integrate aural atoms into *synergetic structures*-perceivable higher-level units that have properties that are different from those of their parts. This structuring process provides additional evidence from higher hierarchical levels of organization. Precision, detail, and organization thus come from a spiraling rigorous practice of ear training and analysis back and forth.

In my experience, students understand the atomistic concept and witness a radical change in their micro-aural skills fairly quickly, but take longer and need more guidance in making the leap to perceiving and constructing higher-level structures. Thankfully, many scholars (e.g. Schaeffer, Chion, Smalley, Roy, Delalande, Normandeau, Thoresen, Schafer, Oliveros, and others) have offered hearing approaches, analytical methods, and systems of thought that can be taught and practiced in order to build experience in structural sound organization. While none of these approaches has become standardized as "Ea music theory", in the manner that tonal music theory has had with Rameau's treaty, this fact does not reflect negatively on the merits of these studies. On the contrary, it illuminates the needlessness of standardization in Ea at large, due to the field's breadth and its innovative nature. I posit that the lack of standards is a positive attribute that supports the field's meteoric evolution. The greater the number of cohesive approaches and angles of exploration of Ea listening and analytical thought, the more aural evidence listeners can gather and integrate. Each approach is a perceptual filter that explores certain kinds of parameters and structures (not the whole picture). By definition, what makes an approach cohesive is the internal logic that holds it together. But other cohesive points of view can provide additional evidence to integrate towards making new connections and generating a more detailed picture and additional layers of organization. Every definable aural parameter—from an existing or new system—can be perceptually filtered and studied atomistically and structurally to provide new data.

Bent (1987) proposed that music analysis is "the means of answering directly the question 'how does it [the music] work?" I posit that analysis can be used to answer, "what is one way in which the music works? What is another? And another?...And what is one way in which all or some of the previous answers work together? And what is another way? And so forth..."-all of this while maintaining a strong attachment to perception (i.e. hearing, not just theorizing), with precision, detail, and atomistic/synergistic structural coherence.

In addition to evidence gathering, atomistic and synergistic training strengthen attentional regulation (the overarching ability to direct attention selectively between perceptual objects) and vigilance (the ability to resist distraction and to hold attention on a single task). Consequently, navigating aurally across parameters and structural levels trains and improves the navigation's intentionality and speed and can accelerate the process of evidence gathering and synergistic structuring. At advanced intentional and attentional levels, students are invited to listen "outside the box" and collect evidence that emerge from setting up aural hypotheses, for instance to perceptually parse a continuous signal even when its acoustic features do not suggest it. Hypothesized atoms and synergies open up the way to new aural data and potentialities, which enrich the aural map made from multiple aural perspectives. It may be questioned whether data based on aural hypotheses are valid, because the hypotheses themselves may at times seem baseless. I propose that they are never baseless if listeners can organize their perceptions to hear them; the hypotheses' audibility is their basis. Above all, creative aural hypotheses are justifiable because Ea is an art form and because it evolves. We innovate by using new technologies, which lead to creating new sounds, which necessitate new ways of listening. In other times we listen in new ways, which leads to new sonic ambitions, which require new technologies. In both examples, aural innovation is central because aural perception is the interface with our consciousness—it determines our experience. The latter configuration, however, may be more oriented around the centrality of perception and therefore purposed more efficiently.

#### References

Bent, I. (1987). Analysis. New York: Norton

#### 3.10.2 Eldad Tsabary

Eldad Tsabary is a professor of electroacoustics (Ea) at Concordia University, founder and director of the Concordia Laptop Orchestra (CLOrk), and president of the Canadian Electroacoustic Community (CEC). In the past decade, he has been the primary developer of an aural training method specialized for Ea. In recent years, he has directed CLOrk in telematic and telemetronomic performances and interdisciplinary collaborations

with symphonic, chamber, jazz, and laptop orchestras, soloists, dancers, VJs, and others. Eldad organized numerous events, including Hug The World 2012 (a telematic jam session involving 23 locations), 60x60 Order of Magnitude (a music/dance/video show involving music by 600 composers), symposia including Understanding Visual Music and Concordia Live and Interactive Electroacoustic Colloquium, among others. As composer his works won prizes and mentions internationally, released on over 20 albums, and performed in hundreds of shows worldwide. Eldad received his doctorate in music education from BU.

# 3.11 Brian Bridges<sup>1</sup>, Ricky Graham<sup>2</sup>

## 3.11.1 Electroacoustic Music as Embodied Cognitive Praxis: Denis Smalley's theory of spectromorphology as an implicit theory of embodied cognition

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As a result of the advent of recording technologies and a developing experimental ethos, twentieth century music composition underwent a 'bottom—up' revolution, placing environmental sound materials at the centre of what had previously been a form more concerned with abstract materials and structures. Beyond the environmental derivation of the raw materials themselves, the structure of electroacoustic music is frequently seen as being related to environmental logics. One of our most influential theories of electroacoustic music, Smalley's (1986; 1997) spectromorphology, approaches musical structure from the perspective of apparent physicality and causality. This parallels a more recent 'bottom—up' revolution within cognitive science, the rise of embodied cognition, which posits that cognitive processes are based on familiar bodily actions and environmental affordances.

Embodied image schema theory (Lakoff and Johnson, 1980; 1999) proposes that cognition is based on schematic structures which are abstracted from common sensorimotor experience. These ideas have previously been applied to common practice music (Brower, 2000; Johnson, 2007; Wilkie, Holland and Mulholland, 2010). However, we consider these theories to be even more directly applicable to electroacoustic music and related forms. We identify parallels between many of Smalley's formal structuring and dynamic principles and image schema theories. Given these parallels, we believe that an examination of electroacoustic music may support the development of theories of embodied cognition. However, more significantly for our own field, we propose that a thorough consideration of image schema theory could contribute to extending unifying theoretical and descriptive frameworks for electroacoustic music. Such an approach also has the potential to inform developments in other areas, including the design of music performance and production systems and human—computer interaction.

### **Keywords**

Spectromorphology, embodied cognition, schemas, environment, form, structure, theory

#### Selected references

Brower, C. (2000). A Cognitive Theory of Musical Meaning. Journal of Music Theory, 44(2), pp. 323-379. Johnson, M. (2007). The Meaning of the Body: Aesthetics of Human Understanding. Chicago: University of Chicago Press.

Lakoff, G. and Johnson, M. (1980). *Metaphors we Live By*. Chicago: University of Chicago Press. Lakoff, G. and Johnson, M. (1999). *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*. New York: Basic Books.

Smalley, D. (1986). Spectro-morphology and Structuring Processes. In: Emmerson, S. (ed.) *The Language of Electroacoustic Music*. London: Macmillan, pp. 61-93.

Smalley, D. (1997). Spectromorphology: explaining sound-shapes. Organised Sound, 2(2), pp 107-126.

Wilkie, K., Holland, S., and Mulholland, P. (2010). What Can the Language of Musicians Tell Us about Music Interaction Design? *Computer Music Journal*, 34(40), pp. 34-48.

## 3.11.2 Brian Bridges

Brian Bridges is a composer and music technology researcher from Dublin, Ireland. He is currently based at Ulster University, Northern Ireland, where he has been Lecturer in Creative Arts/Creative Technology since 2008. His research interests lie in the connection between theories of auditory perception and cognition and creative practices and systems designs. His creative work spans the fields of sound installation and audiovisual practices and electroacoustic and instrumental music. He is a founder—member of the Dublin—based Spatial Music Collective and his compositions have been programmed at festivals in Europe, the Americas and Asia. Brian is a graduate of Trinity College Dublin (M.Phil. in Music and Media Technologies) and the National University of Ireland, Maynooth (Ph.D. on microtonal music) and he has also undertaken private studies in the US with Glenn Branca and Tony Conrad.

### 3.11.3 Richard Graham

Richard Graham is a guitarist and computer musician based in the United States. Graham has performed across the US, Asia, UK, and Europe, including festivals and conferences such as Celtronic and the International Symposium on Electronic Art. He has composed music for British and US television, recorded live sessions for BBC radio, and has authored music for the popular video game, Rock Band. Ricky was an artist-in-residence at STEIM in 2010, where he developed the first iteration of his performance system for multichannel guitar. He received his Ph.D. in Music Technology from Ulster University in 2012 and he is now an Assistant Professor of Music and Technology at Stevens Institute of Technology in New Jersey. His most recent paper on performance systems was presented at NIME 2014 and his most recent musical work, "Nascent", was released on Fluttery Records in 2012.

## 3.12 Yiorgis Sakellariou

#### 3.12.1 What's really going on *here*?

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The title of this paper is borrowed by the homonymous chapter of Christopher Small's book Musicking. In this book the renowned musicologist describes, criticizes and analyses the classical music concert and uses the term *musicking* to introduce his theory that music is an ongoing process, gaining meaning in a live performance, rather than a static object. In our case, "here" refers to electroacoustic music concerts. If Small investigates and questions something so established and standardized as a typical classical music concert, I suggest that it is fruitful, if not essential, to examine the electroacoustic music concert not with the intention of devaluing it but to review the practice and re-evaluate its purpose. I believe we need to constantly challenge, explore and creatively doubt the traditions and settings of electroacoustic music and thus bring them into the present day.

It is not my intention to propose a strict definition of electroacoustic music. The term is broad, sweeping between acousmatic multi-channel concerts to harsh noise performances. It is used to describe purely electronic works of academic composers as well as improvised performances with laptops or field recordings. Nonetheless there are two main features of certain interest that I would like to focus on. Both are examining the concert, as a social activity that aims to create aesthetic pleasure.

No audience underground is the term used by musician and blogger Rob Hayler to describe the global underground experimental music scene. He emphasizes the fact that the participants of the scene (composers, label curators, concert organizers, radio producers etc.) make up the majority of the audience at almost every concert. In other words, the audience consists of people who are actively involved with the music and the presence of "outsiders" is usually an exception. If we examine the constituent of concerts at symposiums or conferences, and despite any differences that arguably exist between the so-called underground/post-punk/DIY music and academic electroacoustic composition, we will observe that similarly the audience consists mainly of active participants (fellow composers, scholars and researchers). The general public is not even expected to attend as the event is organized by and addressed to specialists from the academic world.

I am not implying any positive or negative opinion about this point as I think there are several, even conflicting, ways of approaching this. One could argue that it is pure elitism and music is isolated in its own micro-cosmos, disconnected from the rest of the society. On the other hand, the involvement of the audience shows dedication and commitment. We are part of a small "community of interest", as Leigh Landy puts it, where its active members try to contribute towards its development. Through the members' work, research and writings, the community evolves and, hopefully, progresses. Therefore, I cannot claim that being our own audience is necessarily problematic, however I would strongly suggest to reflect on what this means and how, and if, it affects our individual experiences in relation to our work.

The second feature of interest is also related to the notion of participation but now my hypothesis is concerned with the actual listening experience. If we examine the typical setting of an electroacoustic concert, and more particularly the surround sound system with the mixing desk in the middle and the audience sitting around it, we notice that the concept of a stage is negated. The performer, who usually is also the composer of the work, is sitting among the audience and there is no physical separation between the two. Furthermore, any technical skills are not visually exposed to connect the production or manipulation of sound with any specific gesture made by the performer. The lights are dimmed and often listeners close their eyes as well; the attention is solely focused on sound. Naturally, this has been explored and highlighted before but realizing it is not a sufficient precondition for a successful concert. An additional action is vital for transforming the concert into a significant and profound experience. What is furthermore required, and evident in this setting, is active participation through listening. It is the audience's attention and focus that ultimately elevates the work. Listening is a task, a challenge that can provide a way of creating meaning. The audience, through listening, becomes an additional, perhaps equally important performer. The value shifts from what we hear, or how we generate and organize sound, to how we listen. Active listening is a tool for transformation, of exploring the unseen, it is a way of expanding consciousness to a higher state in which we can encounter the divine.

Consequently, the completion of studio work is not the final destination but the beginning of a journey that takes place in a concert. The concert itself is a tool for intellectual exploration and not simply a platform to present works. We should always remember that a concert is ritualistic in design. In ours, as in every other community, it is a ritual with certain settings and models which derive from a common understanding and language, and symbolize ideal relationships with each other and with the rest of the world. These ritualistic events provide access to a sound-mediated hyper-reality that exists beyond the ordinary. Its social and technical settings suggest that we are all partly responsible for its success, not only as composers or as members of the audience but moreover as permanent participants in a musical community.

With this paper my goal is to find the right questions but not necessarily with the intention of getting concrete answers. Hopefully a set of intriguing questions will generate more original thoughts than any answer. Moreover, I would suggest we consider the EMS, and any other symposium or conference, as an occasion to be doubtful rather than express certainties. If we work towards understanding the set or relationships, the values and meaning that exist within our practice then, if indeed it is our aim, we will be able to spread the interest in electroacoustic music to other communities. Of course we should also think about what these other communities are (online, physical, social etc.) but this is a whole new set of questions to be raised and explored.

### Selected references

Becker, J. (2004) *Deep listeners - Music, emotion and trancing.* Bloomington IN: Indiana University Press. Hayler, R. (2014) 'Liberation through a lack of interest: Jorge Boehringer on the no-audience underground'. [online]. Available from: link [12 December 2014].

Landy, L. (2011) 'Art for Goodness(') Sake: It's your tea party and you can cry if you want to'. Proceedings of the Electroacoustic Music Studies Conference, Sforzando! New York. [online]. Available from: http://www.ems-network.org/IMG/pdf\_EMS11\_Landy.pdf [27 December 2014].

Neill, B. (2002) 'Pleasure Beats: Rhythm and the Aesthetics of Current Electronic Music'. Leonardo Music Journal, Vol. 12, Pleasure (2002), pp. 3-6. The MIT Press. [online].

Available from: http://www.jstor.org/stable/1513341 [10 December 2014].

Small, C. (1998) *Musicking - The meanings and performance of music*. Middletown, Connecticut: Wesleyan University Press.

Storr, A. (1992) Music and the mind. London: Harper Collins Publishers.

#### 3.12.2 Yiorgis Sakellariou

Yiorgis Sakellariou is an electroacoustic music composer. Having a background in classical and Mediterranean folk music, he came to develop his personal language during the early '00s. Since then he has been active internationally being responsible for solo and collaboration albums, having composed music for short films and theatrical performances, leading workshops and ceaselessly performing his music around the globe.

His practice is founded on the digital manipulation of environmental recordings. His palette of sounds is all encompassing; from vibrating rail-tracks to refrigerators' static, and from noisy waterfalls to the humming of insects. His current research as a PhD student at Coventry University focuses on the relation between electroacoustic music and the use of sound in ecstatic religious practices.

Yiorgis Sakellariou is a member of the Athenian Contemporary Music Research Centre and the Hellenic Electroacoustic Music Composers Association. Since 2004 he has curated the label Echomusic http://mechaorga. wordpress.com/

# Chapter 4

# 26.06.2015

# 4.1 Alyssa Aska

# 4.1.1 The Displacement of Agency and Sound Source in Electroacoustic Music as Compositional Approach in Works Including Live Performers

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Music facilitated by technology has led to an unprecedented development in performance-practice: the ability to generate sound without the physical action required when performing on an acoustic instrument. Response to this development has resulted in differing approaches to performance aesthetic preferences, with one direction, for example, emphasizing acoustically-based listening practices. Most removed from this acoustatic research is another approach, emphasizing the development of electronic instruments that replicate the type of human gestural interaction present when using acoustic instruments. This paper examines the incorporation of both previously described aesthetics on a continuum as an approach to composition which provides dramatic and narrative elements to electroacoustic works including live performers. Three recent electroacoustic works by the author are discussed: Memento Mori (2014) for saxophone and live electronics, Ecclesiastical Echoes (2015) for piano trio and The Woman and the Lyre: Sapphic Fragments (in progress) for vocalist, chamber ensemble, and live electronics. Their analysis presents the displacement between agent and sound source as integral compositional narrative approach. Memento Mori, for example, uses a computer vision system to track the performer's distance from the front of a stage. The data transmitted by the camera subsequently affects spatialization and volume parameters of processed sounds. The performer's physical actions are therefore linked to acoustic sounds that are not geographically displaced from the agent, as well as processed sounds that are displaced. The relationship between agent and sound location serves as a narrative element in the piece, using the fact that the performer is continuously present, regardless of the spatialization, as commentary on the idea that, much like performance motion can never be completely linked to sonic response on an electronic interface, the inclusion of a live performer makes it impossible to remove the visual element of the performer completely. This demonstrates that works for live performers and electronics present unique challenges that do not necessarily apply to acoustic works. Ecclesiastical Echoes and The Woman and the Lyre: Sapphic Fragments both employ similar systems as Memento Mori; motion tracking via computer vision enables a connection between performance motion and electronics. However, in *Ecclesiastical Echoes* this is intentionally visually obscured, as the camera is placed inside the piano, tracking motion related to the performance gesture but not the gesture itself. The Woman and the Lyre: Sapphic Fragments incorporates motion tracking that is visible as well as invisible, and also makes use of performer visibility and other staging devices to illuminate the compositional approaches to agent and sound source displacement in a larger scale work.

### 4.1.2 Alyssa Aska

Alyssa Aska is a diverse composer who writes both acoustic and electroacoustic works, although she primarily focuses on works that combine live instruments with real-time electronic processing. Alyssa has also participated in music technology education research projects and sensor-based instrument design. Her music has been performed at concerts, festivals, and symposiums in North America and Europe . She is also an active composer for media, having provided the soundtrack for both Canadian and European films. Alyssa is currently pursuing a Ph.D. in Composition at the University of Calgary under the supervision of David Eagle.

# 4.2 Louise Rossiter

## 4.2.1 Silence and Expectation in Acousmatic Music: Perspectives from a Comparative Analysis

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#### Introduction

This paper will examine the phenomena of silence and gesture within acousmatic music and ways that the relationship between them impact on musical expectation. This will be considered through the analysis of two acousmatic works, *Shortstuff* (Stollery, 1993) and *Break*, (Williams, 2004), both of which make dramatic use of silence and short gestures at the beginning of the work.

Through consideration of existing literature in the field and analysis of these two works, it will be suggested that the use of silence has some wider implications for the creation of expectation in acousmatic music than in tonal western music.

#### Silence Within Acousmatic Music

Silence, its function and its meaning in music is a fascinating, yet vastly unexplored topic. Often, silence has acted as a philosophical discourse for the unsayable, in that we can never know its meaning (Losseff, 2007: 1). Sounds leave traces upon which we can form meaning- a 'something' that both defines and yet limits what we can say in music: that is to say sounds have spectromorphological characteristics that define them as identities. For example, pitch can imply a relational architecture as in tonality or structures based around pitch class sets. In contrast, the qualitative and quantitative dimensions of silence are more difficult to define. I will argue that silence cannot be packed into a simple definition; for example, the *Oxford English Dictionary* defines silence as 'a complete absence of sound'. Musically speaking, however, silence can be considered as a multi-faceted 'object'. Silence has an abstract appearance in both a musical score and a digital audio file but, most importantly; it has a punctuative function in musical grammar. Cooper (2011) points to musical functions of silence as being structural or dramatic, where structural silence is that which articulates sections of a work or individual phrases and dramatic silence has a disruptive effect, for example to delay the continuation of a phrase for expressive purposes.

There is a strong sense of relativity about silence and what we might regard as silence in everyday as well as musical listening. This is perfectly exemplified in the work of John Cage, who suggested in his Doctrine on Experimental Music that silence is an aperture, which results in the listener being more aware of ambient sound around them. (Cage, 1957: 13-14). Silence could be considered the object of a discourse between the act of sound production and the overall frame of listening. For instance, sound dying to a very low level may imply silence, so that we are aware of silence as an object without necessarily experiencing it. It is linked to the idea of 'voice' in ensemble music, for example, a soloist resting whilst an ensemble continues to play, means that the listener might be aware of the soloist's silence within an otherwise sonorous fabric. Furthermore, the notion of silence as an object can be felt in the relationship between sound and reverberant spaces. A sound in a reverberant space may cease such as that we perceive the instrumental agent as silent while the sound 'lives on' in the natural resonance of the space. Thus silence is something that we can experience as a physical state or something implied as in the anticipation of the cessation of sound.

#### Silence and Spectral Space

The nature of the relationship between sound and silence in music is a source of tangible tensions and relaxations. In exploring this idea, I will present a comparative analysis of two acousmatic works, *Shortstuff* by Pete Stollery and *Break* by Tom Williams. These analyses rest not only on the relationships expressed between sound and silence, but the nature of the spectral spaces projected within the sounds themselves, which impacts on the perceived interface between sound and silence.

One way of characterising acousmatic music is in the establishment of a spectral space, defined by Khosravi (2008: 2) as:

"...the available range, occupied by the frequency components of sonic phenomena" that will be explored within the work. Related to spectral space, and equally important, is pitch space- referring to: "...the deployment of pitches between the lowest and highest available pitches to the composer..." (Khosravi, 2008: 2)

Khosravi goes further to suggest that pitch space may be viewed as a subcategory of spectral space, due to the ways in which this may be implemented by the composer. As an example, the composer can highlight specific pitches, which may be more significant than others. Whilst the establishment of a pitch space is of great importance in tonal western music through the establishment of tonality, it might be argued that this is of paramount importance within acousmatic music where there is no necessity for a formal tonal framework to be established or maintained. Spectral space can be an important element in defining the ontology of a piece, as in Smalley's *Base Metals* where there is a continuous development of a spectral space evoking the analogy of a physically evolving, but permanent state of 'being'. Maintaining a convincing blend of a sense of physical permanence and a compelling flexibility of sonic material can become more difficult in works that move away from states of smooth sonic continuity. The two works chosen for analysis here, *Break* and *Shortstuff*, feature phrases lasting only a one or two seconds alongside sometimes lengthy silences. In these works, the implications of pitch space within a very short duration are made more critical because of their relationships with silence.

#### Analysis of Shortstuff and Break

The manner in which *Shortstuff* and *Break* behave in terms of spectral space and silence provide us with different views of the ontology of these two pieces as sound and silence.

The source sound material within *Shortstuff* is created from tiny fragments of sound amassed by the composer- the offcuts of previous tape work, unused sound materials from previous pieces, as well as some synth samples. The sound of shattering glass forms the sole sound material in *Break* resulting in the use of similar sound archetypes in both works. However, there is a distinct variation in the relationship each work shares with silence.

The initial gesture heard in *Shortstuff* has duration of less than a second in length and is followed immediately by a silence of four seconds duration. The implication of this opening gesture is that it is far more difficult to experience an expectation through the normal means of reduced listening and source bonding. A gesture follows at 00'04, and again lasts for just over a second in length, although the material has been extended and developed slightly from the initial gesture of the work. The entire opening section of *Shortstuff* features similar short gestural motifs, followed by lengthy silences and a wide frequency spectrum and dynamic range (figure 4.1), which punctuate the sound canvas.

A different approach is seen within *Break* and, whilst a similar approach to gesture and silence is present, there is far less exploration in both the spectral space, and dynamic range. Within this work, the relationship with silence is very different in a contrasting manner to that observed within *Shortstuff*, with sound punctuating silence. Within the opening seconds of *Break*, the dynamic level remains constant, with little variation present within the spectral space established by the composer (figure 4.2). This full spectral space means that the silences utilized by the composer have less effect leaving little maneuverability for the building of tension and release thereof.

Although both pieces make use of similar typologies of sound, and extended silences, the overarching nature of spectomorphological contouring of the sounds themselves are distinctly different. In *Shortstuff* there is a



Figure 4.1: Spectrogram of the opening seconds of *Shortstuff* (0:00- 0:13)



Figure 4.2: Spectrogram of opening seconds of Break (0:00-0:13)

greater degree of nuance and variation in the pitch and dynamic shaping. From a listening perspective this encourages a more varied range of interactions between each of the gestural forms and the silences around them, leaving more scope for the kinds of musical values that arise from both the structural and dramatic uses of silence, such as anticipation, surprise and fulfillment.

#### Conclusions

From carrying out the comparative analysis of *Break* and *Shortstuff*, it is suggested that the use of silence within music, and particularly acousmatic music has implications for expectation experienced by the listener. In addition to the nature of the sound materials used, acousmatic music is also non-corporeal- it lacks the performers so commonly seen within Western music, and the action and non-action associated with them. Owing partially to the nature of the sound materials used within acousmatic music, there is little or no preparation for sound moving into, or out of silence and consequently, there lacks an embodiment of silence. There is a tangible opportunity for further research with regard to the impact that silence has, and its function as a multi-faceted object in acousmatic music.

#### **Bibliography**

Cage, J. (1957). Experimental Music Doctrine. In: *Silence: Lectures and Writings.* London: Wesleyan University Press. 13-14.

Cooper, B. (2011). Beethoven's uses of silence. In: *The Musical Times*, Vol. 152. No. 1914, pp. 25-43. Khosravi, P. (2008). Exploring the Boundaries of Spectral Space and Tonal Pitch Space. In: *Electroacoustic* 

Music Studies Network International Conference. Paris. Losseff, N. and Doctor, J. (2007). Silence, Music, Silent Music. Hampshire, Ashgate.

Oxford English Dictionary [Online]. Oxford: Oxford University Press.

#### Recordings

Stollery, P. (1993) Shortstuff. On Un son peut en cacher un autre [DVD-Audio] Montreal: Empreintes DIGI-TALes, 2006.
Williams, T. (2004) Break. On Taking Shelter [CD] Northampton: University of Northampton, 2007.

4.2.2 Louise Rossiter

Louise Rossiter is an acousmatic composer based in Leicester, UK. Her research interests lie in acousmatic sound, acoustic ecology and expectation within acousmatic music. She completed her undergraduate music degree at the University of Aberdeen, under the supervision of Pete Stollery, and MMus in Composition with distinction at the University of Edinburgh under the supervision of Robert Dow. She is currently reading towards a PhD under the supervision of John Young and Simon Emmerson at the Music, Technology and Innovation Research Centre (De Montfort University, UK). In 2012, Louise secured joint 1st prize in the prestigious concours d'interpretation spatialisee de l'Espace du Sons in Brussels. Louise's music is released on the Xylem record label.

# 4.3 Tullis Rennie

# 4.3.1 Recording, Representation and Responsibility: questions of authorship and agency when field recording for electroacoustic composition

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#### Recording

Practitioners in the art of field recording are currently experiencing a growing sense of self- awareness. It is similar to the crisis of conscience that rumbled through anthropology in the 1970s and 80s, which overhauled the practice of ethnographic fieldwork in the process. Recent sonic arts discourse has engaged with the artistic practice of field recording, calling to better acknowledge the presence of the recordist as an active agent in the field (Voeglin 2014, Lane and Carlyle 2013, Demers 2009).

This recognition carries with it a heightened sense of awareness and responsibility. As in ethnography, recordists are now encouraged to be increasingly reflexive, and to address moral and ethical issues associated with recording and representation. The choices over what sounds one might record, where, when, how and crucially, why, all become much more significant factors.

For composers, these choices are artistically motivated editorial decisions. The act of recording in the field becomes part of the act of composing. Perhaps those doing it already implicitly understood this. However, are there rigorous attempts to understand the interrelationship between recordist and subject? Should there be?

This paper will examine both the act of field recording and the practice of composing with 'appropriated' sound together. In doing so, the aim is to identify questions and considerations for further discussion, focussing on:

1. the compositional decision-making implicit in the act of field recording

- 2. the socio-cultural and political implications of composing with field recordings
- 3. the perceived authorship and ownership over the recordings themselves, and any resulting composition
- 4. the responsibility of representation of the self and other(s) in composition

### Representation

Field recordings continue to be a source of compositional material for many contemporary electroacoustic composers. How does the crisis of representation within the world of field recording apply to electroacoustic composition, and particularly acoustatic music? If field recordings are decontextualised or masked, and their original context hidden, does this alter or avoid any ethical considerations a composer might face?

As a composer, the question of why one might record something at all can be difficult to answer on ethical grounds, especially if the motive is primarily 'because it sounds interesting and I want to use it in a compositional art work'. We might begin by considering the recordists' connection with the sound they are recording. They may be an 'insider' in anthropological terms or a sonic 'stakeholder' (Blackburn, 2014: 149), which potentially gives the recordist-composer more freedom to capture and work with the sound in question. If the recordist is an outsider, the difficulties become apparently more challenging. Their connection with the place or people they wish to capture, why they are recording, and for whose benefit come under greater scrutiny. How will the insiders to that environment be involved in any of the process? How will the composer represent them?

#### Responsibility

A recent issue of Organised Sound was dedicated entirely to a discussion of ethical issues in composition and the potential of cultural appropriation in electroacoustic music (Andean 2014, Blackburn, 2014, Rennie 2014, amongst others). Within the success of bringing that debate forward, in some senses the discourse is a postmortem. Composers (myself included) are perhaps more often attempting to justify their choices *after* recording, and indeed, after composing.

It might be argued that whilst composers working with 'outsider' cultures have to answer difficult questions about their own agency, the 'insider' composers appropriating sounds common to them escape the call to be more rigorous in understanding why they are recording particular sounds. Perhaps composers should consider the implications of using any field-recorded sounds, particularly for the significance it has to *themselves*. What does the authorial voice say about the self with appropriated sound? Who is really represented in the piece? How might different audiences hear that in different contexts? Andean (2014: 178) suggests that 'the work of art is entirely transactional - a cultural negotiation, with artist and audience as the primary agents... as a locus of cultural communication, exchange and interaction, ethics are fully implicated in the very heart of the art work'.

Michael Gallagher presents the audience's role as making rather than receiving meaning in the act of listening. He writes, 'it may be helpful to recognise that listening is more ambiguous (in relation to meaning) and more ambivalent (in relation to power) than is commonly supposed' (2014: 43-44). This is not to excuse or downplay an overly political position any composer could take but does allow for the audience to make their own mind up about the artistic intentions of a sound work.

Aspects of the composers' cultural identity and active agency within the field are certainly an undeniable part of the process of composition. Do these ever come across as part of the finished work? What really constitutes 'authorship' over field recordings and the sounds derived from them? Do compositions resulting from field recordings ever question socio-cultural, ethical, moral or political codes of practice within the composition itself? Perhaps the very the notion of a composer becomes counterproductive? Simon Emmerson (2000: 127) reminds us that 'often the most interpenetrating multi-cultural exchanges are produced within performing ensembles without a 'composer' in sight'.

Back in the field, Voeglin writes that the switch from absence to presence on behalf of the recordist is a move *away* from authorship, 'where we do not seek to own the sounds of this world, to know and to have them, but understand ourselves to be part of its soundscape, not at its centre but simultaneous with it' (2014: 16).

This perhaps signifies a new way forward for thinking about compositions derived from field recordings. The recordist-composer should recognise the active agency they have in the field, but equally that their 'finished' work is not quite that - it is unfinished without the agency of a listener. Both roles carry an equal level of responsibility, agency and authorship.

#### References

Andean, J. (2014) 'Towards an Ethics of Creative Sound', *Organised Sound*, vol. 19, no.2, pp. 173-181. Blackburn, M. (2014) 'Instruments INDIA: A sound archive for educational and compositional use', *Organised*  Sound, vol. 19, no.2, pp. 146-153.

Blacking, J. (1976) How Musical Is Man? London: Faber.

Demers, J. (2009) 'Field Recording, Sound Art and Objecthood', Organised Sound vol. 14, no.1, pp. 39-45.

Emmerson, S. (2000) Music, Electronic Media and Culture. Abingdon: Ashgate.

Gallagher, Michael (2013) 'Listening, Meaning and Power' in Angus Carlyle and Cathy Lane (2013), On Listening, Cornwall: Uniformbooks, pp. 41-44.

Lane, C. and Carlyle, A. (2013) In The Field: The Art of Field Recording. Cornwall: Uniformbooks.

Rennie, Tullis (2014). Socio-Sonic: An ethnographic methodology for electroacoustic composition. Organised Sound, vol. 19, no.2, pp. 117-124.

Voegelin, S. (2014) 'Collateral Damage', The Wire Magazine (No. 364, June 2014) p. 16.

## 4.3.2 Tullis Rennie

Tullis Rennie is a composer, electronic musician, trombonist, DJ and biscuit obsessive born in Derbyshire, England. He graduated from the University of Manchester in 2006 with a Masters in Electroacoustic Music Composition and was awarded the Peter J Leonard Prize for composition. He has worked in various musical guises across the UK and Europe for the last 12 years, and more recently has undertaken performances and projects in both South America and Korea. He is a founder member of Insectotropics - a multimedia performance collective based in Barcelona. Recent activity has included two research residencies at the UFRJ in Rio de Janeiro, an hour-long broadcast specially composed for Resonance FM and articles published in the peerreviewed journals *Organised Sound* and *Enhancing the Learner Experience in Higher Education*. Tullis is currently researching a PhD in Composition at the Sonic Arts Research Centre, Queen's University Belfast. http://www.longprong.net

## 4.4 Brian Garbet

## 4.4.1 Abstracted Aural Documentaries: Featuring Socio-political Content in Electroacoustic Works

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An approach I refer to as Abstracted Aural Documentary builds upon the traditions of the radio documentary paradigm and combines those practices with the transformational language of electroacoustic music. This involves a hybridity of metamorphic techniques and unconventional influences such as specific documentary techniques and literary devices with a provocative narrative in the form.

My current aesthetic involves a focus on environmental and socio-political content. Two previously composed octophonic works, *Would You Like Fries With That?* and *Mockingbird* are examined, as well as an extensive work in progress that uses sound and source material generated from the elusive Windsor Hum. Compositional strategies with sound material and subject matter that guide the narrative and develop the form will be discussed, as well as the symbolic use of spatialization.

Intrusive hums are increasingly causing social problems and inflicting stress on citizens world-wide. Noise pollution is recognized as unwanted sound that causes psychological and other adverse health issues. One particular case is affecting thousands of residents in the Essex County and Windsor area of Ontario, Canada which shares a border with Detroit, Michigan, U.S.A. It has received widespread and significant media attention and been aptly named the Windsor Hum. The Hum is believed to be originating from Zug Island, a heavily industrialized man-made island located at the confluence of the River Rouge in the state of Michigan and the Detroit River across from Windsor. The issue reached the point to which the Canadian Department of Foreign Affairs funded a joint- research study with the University of Windsor and the University of Western Ontario to locate the source. Due to the complexities of acoustic propagation in the local Windsor region, including geology, vegetation, ground reflections, interference, etc., it was not possible to ascertain the exact source of the Hum.

The aforementioned work in progress involves using the Hum as source material for a large scale work for solo clarinet with live electronics and fixed media. I have conducted preliminary field recordings in Windsor towards this musical work, which is to act as a vehicle to bring awareness to the impact of industrial noise on the social, cultural processes and behaviours of a region's residents. Regardless of the source location, this project integrating the acoustic phenomenon of the Windsor Hum offers an experience, as well as a social message, that foregrounds awareness of the increasing global problem of noise pollution.

# 4.4.2 Brian Garbet

Brian Garbet has composed acoustic and electroacoustic music for film, theatre and concert. While at SFU, he was a Jeu de Temps/Times Play national prize winner with his composition Ritual. He has received airplay and performances across Canada, the United States, New Zealand and Finland. After years of touring and recording with the rock band Crop Circle, Brian completed his Master of Music at UBC and recently began work towards his PhD at the University of Calgary. Currently working with Laurie Radford, he has also studied with Barry Truax, Hildegard Westerkamp, Rodney Sharman, Allan Bell, Bob Pritchard and Keith Hamel.

# 4.5 Nicolas Marty

### 4.5.1 Deleuze, cinema and electroacoustic music

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In his reflection about cinema, Deleuze distinguishes between two large kinds of images: the "movementimage" (1983) and the "time-image" (1985). This marks the separation between: spaces that are dynamically and expressively articulated; and spaces that are contemplated, without rhetorical or dynamic articulation — such spaces "contain" *existents* rather than *events*. In this latter instance, chronology becomes arbitrary, without any causal logic: rather than having the camera follow a character leaving the room, the shot may continue for some time, leaving the viewer free to explore the spatiality of the room.

The movement-image implies that time is subordinated to, and designated by, movement. More generally, it is governed by causality, action, reaction, interaction - that is to say, by sensori-motor links. On the other side, the time-image implies "montrage" rather than "montage": instead of being articulated, dynamized, causalized and rhethorized, time is given *in itself*. Movement becomes subordinated; instead of sensori-motor links, relations internal to the image appear, and imply the necessity for a *reading* of the image by viewers. To summarize, in the movement-image, space is the primary character because it gives time its form. In the time-image, time is the primary character, and may thus give its form to space.



Movement-images Time



Time-image Movement

#### 4.5. NICOLAS MARTY

I do not mean to make a detailed review of Deleuze's work about cinema, which is much too complex to be accurately summarized in a few paragraph. Instead of lingering on cinema studies and semiotics, we'll thus consider this distinction with an *intermedial* approach. Brunson (in press) is currently researching narrativity and intermediality in electroacoustic music for his Ph.D. He is particularly interested in how techniques (notably montage techniques) have been taken from cinema and applied to electroacoustic composition, which could thus be analyzed with this in mind. Further than composition techniques, I'd like to propose that *aesthetic* and *formal* ideas — and, by extension, *reception behaviors* - may be found in both media. My approach will thus be a comparative one.

Landy (2012), in his overview of methods of transcription of soundscapes, offers several possibilities, two of which seem to fit exactly our distinction between movement-image and time-image. In the first one, the transcription is chronological, the x-axis being the line of time, the y-axis allowing for polyphony: time is revealed, punctuated, articulated. In the second one, the x and y-axes represent space; there is no representation of chronology, leaving time for the image to be *read*.



Battier (2013) underlines the difference, already noted by Schaeffer, between the GRM's early musique concrète and Bayle's acousmatic music: the first privileges movement, montage, to drive time; the second privileges time and duration, to allow for the development of movement by framing it — relations become morphological, spatial, substantial, rather than formal, causal or teleological. According to Thoresen (in press), this distinction relates to the couple *character / values*: in note-based music, the play with discrete values is the focus of attention; in sound-based music, however, playing with values allows the character to emerge and to live on for some time. A similar distinction is found again, regarding instrumental music, in Beriachvili (2010). In *expressionist* spaces (*espaces expressifs*), energy and time are gesture-driven, and matter is a secondary attribute (e.g. Boulez and some of Stockhausen). In *impressionist* spaces (*espaces impressifs*), every gesture, every movement, is an attribute of sound matter, and perception becomes a contemplation of musical space, since musical time is unfolding "without merging with our interiority" (e.g. Xenakis and Debussy).

These distinctions clearly resemble the one between *movement-image* and *time-image*. On the first hand, movement happens in, and structures, time (this does not necessarily imply linearity: there may be, as in movies, ellipses and irregularities). On the other hand, time unfolds in, and structures, space: movement, coexistences and alternations all become characters of space, without any major interest in causality. On the first hand, we may talk about expressive montage, in which the sensori-motor link is still preserved. On the other hand, we may talk about *montrage*, sound to be "seen" rather than experienced empathically.

It is to be noted that although Bayle does not agree with any link between his aesthetic and soundscape composition, and although acousmatic composers, such as Smalley and his students, tend primarily to the flow of energy in their pieces, those pieces may also quite easily be analyzed as abstract soundscapes, or at least as abstract spaces, where energy is impressionist rather than expressionist.

In fact, Smalley (2007) wrote an article about what he called "space-form", which corresponds in a lot of ways to the idea of a "time-image".

The temporal disposition of, and relations among, sounds serve to articulate and shape spectral and perspectival space, but even though my perception of sound is the product of time, I ultimately sideline time's formative role. So space can be more significant than time, or at least we can profit by starting with the idea that time can be placed at the service of space rather than the reverse. Time becomes space. (p. 38)

However, time still has an important role, because some of the systemic relations at play do not happen *only in space* but in space *through time*. This is the "crystal image", purest form of the time-image, where "character cannot be explained only through space. They imply non localized relationships." Space is given through time rather than the reverse. Development thus emerges out of the accumulation of spatial forms, movements, relationships, establishing their potential through the unfolding of time as their container.

I'd like to suggest how such theoretical parallels may be of use to us as composers and musicologists. First of all, intermedial approaches may allow us to better understand the making of electroacoustic music, but also its existing aesthetics and forms (e.g. the influence of Deleuze on Bayle, however distorted by Bayle's poetic views, is to be noted).

Furthermore, studying how time and space are articulated in other media, we may find new ways of listening to electroacoustic music, as well as new ways of *teaching* those listening behaviors through intermedial metaphors - that way, one and the same piece of music could be analyzed through different formal lenses. The figure below results from an analysis of Elizabeth Anderson's *Chat Noir* (1998) as a time-image. Given the key to the graphics, one could supposedly follow the entire piece with this sole figure.

Lastly, for those of us who also happen to compose electroacoustic music, such listening behaviors and such conceptions of sonic relationships could allow for the emergence or development of explicitly intermedial aesthetics and forms.



#### References

BATTIER, Marc. (2013). "La composition concrete et acousmatique : Pierre Schaeffer, le Groupe de recherches musicales et leurs precurseurs", in Nicolas DONIN and Laurent FENEYROU (eds.), *Théories de la composition musicale au XXe siècle*, Lyon, Symetrie.

BERIACHVILI, Georges. (2010). L'espace musical : concept et phénomene - à travers l'avant- garde des années 1950-60 (Stockhausen, Xenakis, Ligeti...). Doctoral thesis in musicology, sup. Pierre-Albert Castanet, Université de Rouen.

BRUNSON, William. (in press). "Triangulating narrativity in electroacoustic music", in Nicolas MARTY (ed.), Musiques électroacoustiques/Analyses - Écoutes, Paris, Delatour.

DELEUZE, Gilles. (1983). L'image-mouvement (Cinema 1). Paris: Les Editions de Minuit.

DELEUZE, Gilles. (1985). L'image-temps (Cinema 2). Paris: Les Editions de Minuit.

LANDY, Leigh. (2012). Making Music with Sounds. New-York and London: Routledge.

SMALLEY, Denis. (2007). "Space-form and the Acoustic Image", Organised Sound, 12(1), p. 35-58.

THORESEN, Lasse (in press). "Analyse perceptive des formes émergentes. Une approche gestaltiste de l'analyse

#### 4.6. MITCHELL HERRMANN

#### 4.5.2 Nicolas Marty

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# 4.6 Mitchell Herrmann

## 4.6.1 Unsound Phenomenologies: Harrison, Schaeffer, and the Sound Object

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As Jonty Harrison himself acknowledges, a significant body of acousmatic music exists which has, directly or indirectly, challenged aspects of the Schaefferian theory from which acousmatic music first developed. Few pieces, however, have so clearly and deliberately confronted Schaeffer's notion of the 'sound object' as Harrison's Unsound Objects. Harrison does more than merely reject Schaeffer's definition of the sound object through the use of expanded compositional strategies. Rather, he both employs Schaeffer's methodology and subverts it, systematically demonstrating the potential and the limitations of Schaeffer's epoche and its product, the sound object. The result is what might be aptly termed the 'unsound object': a sonic entity which both demonstrates and defies Schaeffer's ideals, and exemplifies the rich ambiguities which can arise from the compositional exploitation of referentiality and association, in addition to the intrinsic, morphological characteristics emphasized within Schaeffer's reduced listening. Key to understanding Schaeffer's ideology, and in particular its faults, is an investigation into the field of phenomenology, from which Schaeffer borrowed liberally. This paper will first outline the key features of the sound object and epoche as defined by Schaeffer, as well as their relation to Husserlian phenomenology. Harrison's methods for subverting these features are then explored, in particular the recontextualisation of sound objects. Finally, the essay examines Harrison's use of metaphor and narrative, devices not possible within a strictly Schaefferian musical language.

### 4.6.2 Mitchell Herrmann

Mitchell Herrmann is a composer and video artist studying at Oberlin College and Conservatory. Although his primary focus is on acousmatic music, Herrmann's previous work has included experimental film, installations, and acoustic music. His compositions have been particularly influenced by his study of phenomenology and embodied cognition. His work has been accepted into festivals around the world including the International Computer Music Conference, Seoul International Computer Music Festival, New York City Electroacoustic Music Festival, Toronto International Electroacoustic Symposium, and Electronic Music Midwest. Recently, his piece Kettledrum Organ was selected for the 2014 SEAMUS Miniatures album. In October of 2014, he was the youngest composer accepted to study with Jonty Harrison in residence at the Atlantic Center for the Arts. Herrmann has studied composition under Peter Swendsen, Tom Lopez, and Josh Levine, and participated in master classes or lectures by George Lewis, Robert Normandeau, Pierre Jodlowski, and Bertrand Dubedout.